DOCUMENT RESUME

ED 401 465 CE 072 993

AUTHOR	Andrew, Erika Nielsen, Ed.
TITLE	As Teachers Tell It: Implementing All Aspects of the Industry. The Case Studies. [Volume One].
INSTITUTION	National Center for Research in Vocational Education, Berkeley, CA.
SPONS AGENCY	Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE	Oct 96
CONTRACT	V051A30003-96A; V051A30004-96A
NOTE	180p.; For related supporting materials, see CE 072 994.
AVAILABLE FROM	NCRVE Materials Distribution Services, Western Illinois University, 46 Horrabin Hall, Macomb, IL 61455; telephone: 800-637-7652 (order no. MDS-885A: $15).
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC08 Plus Postage.
DESCRIPTORS	Academic Education; *Career Exploration; Case Studies; *Curriculum Development; Educational Change; *Educational Improvement; Educational Legislation; *Education Work Relationship; High Schools; *Integrated Curriculum; Program Effectiveness; *Vocational Education
IDENTIFIERS	*All Aspects of the Industry; Cambridge Public Schools MA; Milwaukee Public Schools WI; Oakland Unified School District CA; Pittsburgh School District PA

ABSTRACT

The All Aspects of the Industry (AAI) approach, one of a number of educational reforms designed to reduce the gap between vocational and academic education, provides a framework for schools to redesign their programs around broadly conceived, interdisciplinary, industry-focused programs. With an AAI framework, schools can prepare students for a range of workplace roles and for participation in high-performance work organizations. These programs provide an enriched environment for a blend of vocational and academic education, career exploration opportunities, and more effective school-to work transitions. A series of workshops allowed organizational representatives and school team members involved in AAI to share successes and techniques. Four case studies illustrate applications of the AAI approach: (1) a team in Oakland, California incorporated AAI in four major components of its Health and Bioscience Academy; (2) the Cambridge, Massachusetts team used AAI as the theme for reshaping the 10th-grade curriculum at Rindge School of Technical Arts to integrate exposure to different career paths with the provision of transferable vocational and academic skills; (3) Milwaukee's (Wisconsin) South Division High School team expanded an existing hospitality management project to encompass more aspects of industry and designed a larger-scale project for future implementation; and (4) Pittsburgh's (Pennsylvania) educators produced an assessment rubric based on AAI for assessing work-based learning projects in Pennsylvania Youth Apprenticeship Programs. Evaluation of the projects showed the following: they all emphasize student ownership, make students take responsibility for their education, appeal to students' interests, develop structured pathways, use experiential learning methods, create individualized learning experiences, and create and foster communities of which students and staff can feel a part. (KC)

ED 401 465

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National Center for Research in
Vocational Education

University of California, Berkeley

AS TEACHERS TELL IT: IMPLEMENTING ALL ASPECTS OF THE INDUSTRY

THE CASE STUDIES

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CE 072 553

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THE CASE STUDIES

Edited by

Erika Nielsen Andrew

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Jobs for the Future
The Learning Research and Development Corporation

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Supported by
The Office of Vocational and Adult Education,
U.S. Department of Education

October, 1996 MDS-885A

FUNDING INFORMATION

Project Title: National Center for Research in Vocational Education

Grant Number: V051A30003-96A/V051A30004-96A

Act under which Funds Administered: Carl D. Perkins Vocational Education Act
P.L. 98-524

Source of Grant: Office of Vocational and Adult Education
U.S. Department of Education
Washington, DC 20202

Grantee: The Regents of the University of California
c/o National Center for Research in Vocational Education
2150 Shattuck Avenue, Suite 1250
Berkeley, CA 94720-1674

Director: David Stern

Percent of Total Grant Financed by Federal Money: 100%

Dollar Amount of Federal Funds for Grant: $6,000,000

Disclaimer: This publication was prepared pursuant to a grant with the Office of Vocational and Adult Education, U.S. Department of Education. Grantees undertaking such projects under government sponsorship are encouraged to express freely their judgement in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.

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ACKNOWLEDGMENTS

A collaborative project develops its strength from the sheer synergy of its members. In this particular project, many individuals came together to study the potential and power of All Aspects of the Industry (AAI). Most significantly, this project benefited from the great leadership of Charles Benson without whom our work would not have been possible. We miss him terribly and continue to work hard in honor of his inspiration and wisdom.

My thanks to the partnering organizations who gave willingly of their time and who energy, and who spent many long days debating ideas. In particular, I'd like to thank the trio from the Center for Law and Education—Paul Weckstein, Lauren Jacobs, and Talmira Hill—whose collective wisdom and expertise created and advanced the AAI provision; Martin Nahemow, Learning, Research and Development Corporation, who had much to teach us about assessment; Erin Flynn and Barbara Roche, Jobs for the Future, who furthered our understanding about work-based learning; and Lori Chajet and Andy Furco of the National Center for Research in Vocational Education, who helped us to broaden our ideas and see the connection to many other reformers.

I would also like to thank the educators who studied AAI with us and who generously shared their stories in these case studies. Your front-line experiences brought AAI to life:

- Oakland Health and Bioscience Academy: Patricia Clark, David deLeeuw, Jennifer Yates (Merritt College), Michael Allerton (Kaiser Permanente), Patricia Bayonne-Johnson, and Marlysis Piver
- South Division High School, Milwaukee: Barbara Anderson, Phil Balwinski, Sue Eskuche, and Bob Ilk (Milwaukee Area Technical College)
- Rindge School of Technical Arts, Cambridge: Jim DeLena, Manuel Goncalves, Mark McDonough, and Larry Rosenstock
- Pittsburgh Youth Apprenticeship Program: Diana Coumos (Peabody High School), Margaret Holder (Elizabeth Forward High School), Dave Pacolay (Peabody High School), and Jean Simcic (Schenley High School)

This project was also made possible by the generous support of the Joyce Foundation. In addition, the Center for Law and Education's VOCED project received funding from the DeWitt Wallace-Reader's Digest Fund, the Ford Foundation, the Joyce Foundation, and the Charles Stewart Mott Foundation. We appreciated the opportunity to research and design programs around AAI and hope readers of this document benefit as much as we did from our explorations.

EXECUTIVE SUMMARY

The reauthorization of the Carl D. Perkins Vocational and Applied Technology Act (Perkins II), and most recently the School-to-Work Opportunities Act (STWOA), give schools the opportunity to reverse the seventy-year gulf between vocational and academic education created by the Smith Hughes Act in 1917. Perkins II and STWOA call for a new design of education centered around four categories of integration. First, they require the integration of vocational and academic education. Second, they call for integration among educational institutions through Tech Prep and other programs. Third, they call for a fusion of school and work experiences through key connecting activities. And fourth, they advocate that all students be provided with "strong experience and understanding of all aspects of the industry" (i.e., planning; management; finances; technical and production skills; underlying principles of technology; labor and community issues; and health, safety, and environmental issues).

An All Aspects of the Industry (AAI) approach creates a framework for schools to redesign their programs around broadly conceived, interdisciplinary, industry-focused programs. With an AAI framework, schools can prepare students for a range of workplace roles and for participation in high-performance work organizations, where front-line workers take part in management decisions. Hence, in addition to technical skills, students learn skills that are easily transferred to other industries such as planning skills. The success of an AAI approach depends on the input and influence of a broad stakeholder group, including employers, labor, environmentalists, and community residents.

Developing these kinds of programs can have important benefits for students because they provide (1) an enriched environment in which vocational and academic integration can occur; (2) skills and experiences needed for a variety of workplace tasks and roles, including entrepreneurship and management; (3) school-to-work transition; (4) community development activities through collaboration with economic development activities; (5) a rich platform for analysis, problem solving, and utilization skills in reading, writing, math, science, and social sciences; and (6) exploration of a particular field in-depth, along with transferable skills which expand opportunities to do other things.

Despite these merits, in our work with schools around the nation, we found an absence of implementation of the AAI clause in school-to-work transition programs such as youth apprenticeship, Tech Prep, integration, and work-based learning. For this reason, the National Center for Research in Vocational Education (NCRVE), in collaboration with The Center for Law and Education; Jobs for the Future; The Learning Research and Development Center; and team members from one of each of these organization's networking schools: South Division High School, Rindge School of Technical Arts, Oakland Technical High School, and Pennsylvania Youth Apprenticeship Program was awarded a grant by the Joyce Foundation to study the AAI clause.

We conducted a series of workshops involving organizational representatives and school team members, visited schools, and had many complicated discussions. The purpose of our work was

- to provide partnership members the opportunity to learn from one another about how AAI fits into their school-to-work reform approach, and disseminate this information to teacher networks, administrators, and policymakers.
- to collaborate with industry representatives, AAI specialists, and teachers to develop ways in which AAI may be incorporated within a context of vocational and academic integration; collaborative, student-centered learning; and project-centered instruction.
- to identify the primary obstacles, challenges, and issues that different sites face in developing their respective programs.
- to clarify the primary areas of agreement and disagreement among participants as to what AAI means.

We have shared our thinking about the use of AAI as a focus for school restructuring in a teleconference and now here in this report. Because of the complex nature of AAI, we felt case studies written by the implementers themselves would best capture our collective lessons in action. In addition, the more we explored AAI, the more we realized that, as a reform vision, it had quite a bit in common with the vision and implementation of other reform agendas. Thus, this report also features insights about the implementation of complex reforms (e.g., Coalition of Essential Schools, Foxfire) as told by educators in complementary reform movements.

INTRODUCTION AND SYNTHESIS: WHAT WE MEAN BY ALL ASPECTS OF THE INDUSTRY AND WHAT IT MEANS FOR YOU

by Lauren Jacobs
Center for Law and Education

> I teach carpentry and have my own contracting business. I'd like to retire soon, but I'm worried. My kids are great carpenters, but they have no idea how to raise capital, deal with zoning and contracts, or manage a business. Looking at my students, I'm realizing that they wouldn't be prepared to take on those responsibilities, either.
>
> As a language arts teacher, I've been working with the vocational teachers to integrate language arts with such subjects as food services, auto mechanics, and carpentry. I've had students do some business correspondence and descriptive writing, but I just don't see a way to move it much further. I'd like to because where I have integrated learning, students have been more engaged.
>
> There are very few businesses and . . . jobs [are scarce] near my school. I'd like to bridge the gap between what my students are learning in school and the reality they are facing every afternoon when they leave the building.
>
> I teach in a Hotel and Restaurant Careers program. My students' parents have been holding meetings to close down the program. The parents criticize the program as preparing their kids for menial labor and tracking them away from college options.
>
> I used to teach in private school. Now at public school, I really appreciate the rights that being a union member brings me. Before my students graduate, I want them to understand some of the current labor issues in the U.S. and be able to look at them from different perspectives.
>
> My students want the American Dream. They want to be successful, to make lots of money, and run the show. They know job skills alone aren't going to get them there.
>
> I teach World History and U.S. History. I am now expected to integrate my curricula with vocational education subjects. I don't see how.
>
> Our high school is built on the belief that there are two kinds of students: those who have "the stuff" to go to college, and those who don't. We're looking for a way to reorganize to give all of our students the skills and knowledge both for work and for college.

These are some of the perspectives that have prompted educators to implement All Aspects of the Industry (AAI) reforms—that is, to provide students with strong experience in and an understanding of all aspects of the industry they are preparing to enter, including planning; management; finance; technical and production skills; underlying principles of technology; community issues; labor issues; and health, safety, and environmental issues. Efforts to provide students with this experience and understanding are often abbreviated to "All Aspects of the Industry" or "AAI."

The Concept: What Is AAI?

AAI offers a different way to view vocational education and, as discussed later, secondary education in general. It is a strategy for utilizing some of vocational education's strongest assets, including experiential learning and coaching relationships. The idea is to engage students in exploring an industry as a whole, and the many roles they can play in it. In the traditional model of vocational education, where students train for particular occupations or clusters of occupations, change is a major obstacle. Technological changes mean that new equipment is needed, which is a strain on budgets. Economic shifts can cause "help wanted" advertisements to vanish, while unemployment lines materialize. While no educational reform can prevent technological or economic changes (nor should it!), AAI is one way to convert technological and economic change into a learning opportunity, rather than an obstacle. Students can study the causes of change and how different people and organizations within the industry respond to it.

AAI entails a different set of expectations and opportunities. Rather than preparing students solely to be employees, programs redefined around AAI prepare students to be economic and social actors, making decisions and choices. These programs reject putting any limits on what students can choose to do.

The AAI approach integrates *content, context,* and *method*. The *content* includes, but goes beyond, technical skills. Federal vocational education and School-to-Work laws identify eight aspects of industry: (1) planning; (2) management; (3) finance; (4) technical and production skills; (5) the underlying principles of technology; (6) community issues; (7) labor issues; and (8) health, safety, and environmental issues. The aspects identified in federal law are meant to serve not as a checklist of rigidly defined content areas, but, rather, as an outline of the different functions performed within an industry and the forces that shape it. Some of the most interesting learning opportunities have to do with how different aspects relate to and influence one another (for instance, how changes in technology affect finance issues in the health industry; or the interplay between planning, finance practices, and community issues in the construction industry).

When fully implemented, AAI fosters critical thinking skills by teaching students to compare different perspectives and explore interrelationships. Students study not only labor issues in the industry, but also a labor perspective on management and finance practices; not only community issues, but also a community perspective on environmental issues. Almost every industry faces dilemmas and is alive with healthy (or sometimes not so healthy) conflicts. Within the context of an industry, students can learn to analyze, to ask probing questions, and to form their own opinions.

The *context* of a particular industry is what keeps AAI content from becoming too abstract. Teaching principles of technology could be quite dry, but it is less likely to be so when students are studying those principles in the context of how they have led to new products and practices in an industry, and when students are simultaneously learning to use equipment based on those principles. It does not matter, ultimately, if the student works in the specific industry. The skills and knowledge are, to a large extent, transferable, but the industry gives a specific context that helps students gain and apply knowledge.

AAI builds on the best of traditional vocational *methodology*. Using the abbreviation "AAI" sometimes misses the full concept—"to provide students with strong experience in and understanding of all aspects of the industry they are preparing to enter." In order to provide students with experience, as well as understanding, teachers find they must move away from lecture-style, passive learning models to more active, project-oriented teaching. In one of this book's case studies, Milwaukee teachers discuss their transition to more experiential pedagogy:

> It is much easier to teach students AAI through a project. It wasn't always that way. We used to lecture with overheads as we individually dissected the parts of entrepreneurship, business, etc.; curriculum becomes more meaningful and applicable when taught through projects and woven in and out of the curriculum.

When most effective, AAI is not seen as a separate reform to be implemented as yet another add-on to the educational program, but as a guiding principle underlying all. In part because it integrates content, context, and method, AAI ties many aspects of school change together. In another of this book's case studies, Oakland educators offer the following view:

> While incorporating AAI can seem like a burden at first, we now have a very different perspective on it: We believe AAI should serve as a set of guiding ideas that can give our program coherence: Coherence for students so that the different parts of the program relate to each other; coherence for staff in the midst of the stress and turbulence that is teaching; and coherence through time, to ride over staff changes, schedule changes, new opportunities and new difficulties, and arrive at the other side a richer and better program.

AAI is strongly related to vocational and academic integration. Analyzing and solving the problems facing an industry and the enterprises within it draws upon both basic and advanced skills and knowledge in language arts, mathematics, science, and social studies. Labor issues, community issues, finance, and environmental issues lead teachers and students back into history, politics, and the social sciences—subjects which are rarely integrated now. Reading the case studies that follow, it is sometimes hard to distinguish between AAI and integration efforts, so closely are they intertwined. That is not to say that AAI is the same as integration—there are many integration efforts underway that just integrate selected academic subjects with occupationally specific technical skills. However, when a school takes both as goals, the two complement and complete each other.

As discussed in this book's final chapter ("Learning from Experience: Advice from Complementary Reforms"), some of the most extensive school reforms today focus on restructuring schools into small learning communities in an effort to move away from the shopping-mall model of high school (in which students choose from a large number of courses, often based primarily on social or other non-educational criteria). This movement also springs from an increasing awareness of the negative consequences of tracking (the division of a school into different sequences of classes, with students placed into more or less challenging tracks). Educators and communities are seeking routes that retain some student choice in curriculum, while ensuring that all students are prepared to meet high academic standards. Smaller settings enable teachers and students to get to know one another, to coordinate integrated curriculum, and to make decisions as a group.

The most common vision of a small learning community is one that is built around a particular theme. AAI can serve as the underpinnings, or theme, for the reorganization of a school into smaller learning communities. Industries are natural themes. The problem historically has been that industry- or vocationally oriented programs have focused solely on preparing students for work, in effect cutting off their options for college, particularly four-year college. Low academic standards for vocational programs contributed to the problems of tracking. In contrast, a learning community organized around teaching AAI and integrating vocational and academic education can be very effective. As long as the industry is defined broadly enough to encompass career paths that require baccalaureate degrees and those that do not, AAI lends itself naturally to preparation both for work and for further education. Of course, it is not necessary that all learning communities use work-oriented themes. But if the theme is work-oriented, AAI and vocational and academic integration are vital to ensuring high academic quality. Some schools use non-industry themes (such as New York's Peace and Justice Academy and Philadelphia's African-American Studies Charter), either solely or side-by-side with industry themes. On the other hand, some school districts now seek to prepare all students for both work and further education, and there, in particular, AAI is a vital concept.

AAI's relevance is not limited to within the school building, or to schools and workplaces. Larry Rosenstock, Executive Director of the Rindge School of Technical Arts in Cambridge, Massachusetts, explains,

> Teaching all aspects of an industry is not just a pedagogical technique. It has a practical goal as well: To prepare students for an active role in the development of their own communities. Most vocational students come from low-income communities where few high-wage, high-skill jobs are waiting for them. A further challenge to vocational education, then, is to involve students in job creation and the development of local enterprises.

The History and the Law

"All aspects of the industry" is a relatively new term, but it is not a new idea. Vocational agriculture has always taught students all aspects of running a farm, from animal husbandry to farm finance. AAI has been implicit in some of the most effective vocational education reforms. The California Partnership Academies, for instance, are school-within-a-school programs built around broad industries (health; media; law and government). Academies often reach beyond technical skills to provide students with experience and understanding of the industry as a whole.

Until 1983, there was no common language for discussing AAI. At that time, Paul Weckstein of the Center for Law and Education, a national advocacy and technical assistance organization, articulated the following goal: "providing students with strong experience in and understanding of all aspects of the industry they are preparing to enter." The Center's VOCED Project has continued to lead the AAI movement by advocating that federal vocational education and School-to-Work policy be shaped around AAI, and by working with communities and schools to translate the concept into reality.

As early as 1984, AAI gained the powerful support of Senator Edward Kennedy of Massachusetts. Speaking to the Senate on October 3, 1984, Senator Kennedy explained his reasons for supporting AAI:

> This provision is very important on both educational and economic grounds. In educational terms, it helps to ensure that our Nation's renewed focus on educational quality and excellence is carried into the vocational wing of the school and that vocational education will not be used to limit the educational opportunities of students. In economic terms, it helps us to move away from the notion of "throw-away" workers, trained for a narrow set of skills and disposed of when the need for those skills disappears.

In 1990, AAI became part of federal law with the Carl D. Perkins Vocational and Technical Education Act Amendments (Perkins II), which fund secondary and postsecondary vocational education programs. Perkins II defines "general occupational skills" as "experience in and understanding of all aspects of the industry the student is preparing to enter, including planning; management; finance; technical and production skills; underlying principles of technology; labor and community issues; and health, safety, and environmental issues." Planning and accountability procedures at both the local and state levels focus on providing students with experience and understanding in all aspects of the industry.

The School-to-Work Opportunities Act (STWOA) of 1994 (which provides assistance for localities and states to develop school-to-work systems) places an even greater emphasis on AAI, making it one of five overall requirements for funded programs. In addition, program performance measures under the Act are to include "student experience in and understanding of all aspects of the industry" as a criteria.

Also in the early 1990s, individual states began to adopt the AAI approach and initiate development work. When Massachusetts enacted a far-reaching education reform bill in 1993, it adopted an AAI approach to vocational education. Missouri's Instructional Materials Laboratory took the lead in designing technical assistance materials when it convened five industry advisory committees to flesh out the competencies expected in each aspect of those industries. Based on that early work, the Laboratory has since created AAI training modules. As California's School-to-Careers Committee members began development of curricular frameworks in 1995, they planned to design them around AAI.

Each school and each state implementing AAI has taken the concept in its own direction. Adding aspects (ethics, history, professional responsibility) is common and is an indication that AAI is stimulating important discussions about what communities expect from vocational education and school-to-work programs. Other impacts can be viewed from the vantage points of the different parties involved: students; schools and staff; and businesses and communities.

What AAI Means for Students

> Life is "all aspects" all the time—no one lives in one dimension. The "all aspects of the industry" approach equates learning to living.
>
> —Christopher Dyer
> Corporate and Creative Services
> Boston, Massachusetts

By changing programs' expectations of students, AAI can help students to change their expectations of themselves and give them the opportunity to envision themselves as movers and shakers, as people who can make a difference in the world around them. At the same time, it can give them the skills and knowledge to actually make that difference. With a strong understanding of planning and finance, of technologies and the principles that underlie them, of community and labor issues, students cannot only adapt to changes, they can proactively contribute to positive change.

They can also formulate and cope with changes in their career plans. As the Milwaukee team notes in its case study,

> While we would like to think all of our graduates will continue with careers in hospitality, we know this isn't true. The "meat" of AAI is in all industries. What our students understand about finance in the hospitality industry they will be able to transfer as they make career changes.

Unfortunately, many students live and study in areas with few employment opportunities, particularly high-wage opportunities. They emerge from the school building everyday to see dilapidated houses and abandoned factories. AAI gives these students the opportunity and skills to analyze what is happening and what they would like to see instead. It does not assume that they will go to where employers are, but, rather, improves their capacity to develop their own businesses and to contribute to community economic development efforts. As Dorothy Williams, Principal of Flower Vocational High School in Chicago, tells her students, "Why leave your community? Why not stay here and make it the community you want it to be?"

What AAI Means for Schools and Staff

AAI frees teachers to draw on their lives outside the school. As the Cambridge team notes in its case study, "From the start, teachers who had experience in industry found the AAI approach validating; it affirmed what they knew from their own experience."

The traditional model of vocational education has put schools on treadmills, constantly chasing employment predictions that often prove false or that lead, not to challenging educational content, but to task lists that restrict teacher creativity. By expanding the learning goals to include not only technical skills, but also more varied knowledge and experience, AAI reduces this reliance upon economic forecasts of precisely what jobs will be available and what skills they will require. It also relieves the financial demands on schools. If the whole curriculum is built around technical and production skills, then the quality and relevance of the entire program rests on having up-to-date equipment. That places constant pressure on schools to upgrade equipment—an expectation that most school budgets cannot meet. If technical skills are but one part of an AAI-oriented program, then schools have more latitude in balancing equipment needs and financial capacity.

Perhaps most importantly, as the Oakland team discusses, AAI can help reduce goal overload and improve cohesion by tying together the many reforms taking place in schools today.

What AAI Means for Businesses and Communities

Just as many schools are in the midst of change, so are many workplaces. Secretary of Labor Robert Reich wrote in the *Washington Post* on July 28, 1993,

> High-performance workplaces are gradually replacing the factories and offices where Americans used to work, where decisions were made at the top and most employees merely followed instructions. The old top-down workplace doesn't work any more. That's because the old competitive advantages—large scale and specialized machines doing the same operations over and over—have been eroded by global competition and by new technologies capable of performing many different functions.

While most jobs are still in old-style workplaces, more and more high-wage opportunities are to be found in these high-performance work organizations (HPWOs). Yet vocational education—and many say our school system as a whole—is not preparing students for HPWOs. The 1991-1994 National Assessment of Vocational Education found that HPWOs are much less likely than traditional employers to give good ratings to secondary vocational programs. The reason may lie in the narrow skill training of many vocational programs. Providing students with strong experience in and understanding of all aspects of the industry goes a long way toward preparing students for the flexibility and shared decision-making of HPWOs.

Most importantly, AAI addresses the need for well-rounded, well-educated citizens. As teachers help students to analyze community issues and to understand how industries function, they are increasing student—and thus, community—capacity to identify and meet community needs.

About This Book

This book is the work of over 25 people from four national organizations and four schools. It attempts to document four approaches to implementing AAI reforms and to explore some of the strategies employed, not only by AAI reformers, but by those leading related efforts. The case studies are not, as is usually the case, dispatched in the cool, detached tone of the academic researcher, but instead are told by the immersed, often overwhelmed, and deeply committed voices of the teachers involved.

The educators and organizations involved in this study were convened by NCRVE. Concerned about the lack of knowledge at the local and state levels about what is meant by "all aspects of the industry" and by the paucity of research on how to implement it, NCRVE invited the Center for Law and Education, Jobs for the Future, and the Learning Research and Development Center to join in a collaborative project, working directly with schools to explore ways to implement AAI. The schools selected (and willing to commit ever-scarce time to the endeavor) were the Health and Bioscience Academy at Oakland Technical High School in California; the Rindge School of Technical Arts in Cambridge, Massachusetts; South Division High School in Milwaukee, Wisconsin; and the Pennsylvania Youth Apprenticeship Program in Pittsburgh.

Over the course of the 1993-1994 school year, teams of educators from the four schools met with staff from the organizations and with one another to exchange ideas, dilemmas, and strategies for implementing AAI in the context of their differing school structures. At the conclusion, they put pen to paper—or more often, fingers to keyboard—to share their experiences and thoughts. (For some, this reflective process stretched over the next year and more, and the discerning reader will notice in some of the case studies the inclusion of information on the 1994-1995 and 1995-1996 school years.)

The resulting case studies, which comprise the next four chapters of this book, present not only different curriculum ideas for implementing AAI, but also diverse perspectives on how AAI relates to other types of vocational and secondary education reforms and ideas for thorny implementation problems and dilemmas. The ambitiousness of the teams' goals and the extent to which the AAI effort influenced other initiatives at the school varied widely:

- The Oakland team worked to incorporate AAI throughout four of the major components of the Health and Bioscience Academy, including worksite learning experiences, student portfolios, curricular projects, and postsecondary articulation.

- The Cambridge teachers used AAI as the theme for reshaping their tenth-grade curriculum to better integrate exposure to different career paths with the provision of transferable vocational and academic skills.

- Milwaukee's team expanded an existing Hospitality Management Project to encompass more aspects of industry and designed a larger-scale project for future implementation.

- Pittsburgh's educators produced an assessment rubric based on AAI for the purpose of assessing work-based learning projects in Pennsylvania Youth Apprenticeship Programs, and also developed an all aspects Bridge Project.

In each site, efforts to implement AAI brought issues of curricular depth to the forefront. After initial responses of "we're already doing that," many of the teachers began to probe how well they were doing it, whether they were teaching enough about labor issues, and whether students were really getting sufficient experience in planning and management. The Oakland team reported, "One of the first things that became clear to our team as we thought about implementing AAI in our curriculum was that we were not entering uncharted waters." That fact that the waters were charted, though, did not mean that they had already "been there, done that." Their case study is rich in new ideas and augmented goals.

AAI proved to be a useful tool for integrating critical thinking. The rigor of the new work in some of the schools makes a compelling case that vocational students have the capacity for doing challenging intellectual work—despite the forces and stereotypes that may have led them to vocational studies. The Cambridge team writes,

> Some of the most successful AAI course content was actually quite sophisticated. We spent the better part of two weeks in Humanities exploring how the Industrial Revolution affected labor/management relations, using simulations, lectures, discussions, and reflective writing. A good deal of the content revolved around the transition from "task-oriented production" to "time-oriented production" and the impact of "Taylorism" and related "time-study" management systems on the workplace. It was gratifying to see Cambridge public high school students

> grapple with the same ideas that would be taught across the street at Harvard in a course on Labor History.

Multidisciplinary projects were an important strategy at all of the sites. Oakland even found a way for students to make real contributions in a field with major obstacles. "In health care, we face an obstacle to this strategy [student enterprises]—students cannot perform clinical tasks with patients. Health education is an area in which students can create real products." The Pittsburgh team focused on projects and assessment of student work on projects because the PYAP curriculum utilizes projects throughout. Projects served multiple functions—even beyond providing a motivating and hands-on setting for learning. In Cambridge, small-scale projects enabled teachers to experiment with ideas that later formed the foundation for a new course, while larger-scale student enterprises served as the setting for extensive work-based learning. The Milwaukee team used a project to demonstrate the AAI approach to other teachers and to convince them to join in larger efforts.

In addition, the initiators of case sites noted the value of AAI as a rubric for assessing not only student learning, but educational settings and curriculum ideas. The Pittsburgh team decided after developing its project assessment rubric that the rubric was applicable for assessing not only senior work-based projects, but for any work-based projects. Moreover, it was valuable as a design tool for teachers planning projects. Milwaukee teachers noted, "AAI forces us to look at the internship sites where our senior-level students are placed. It places an emphasis on finding training sites that offer students an opportunity to experience all aspects of an industry."

Back in 1993, the four school sites were chosen in large part because of the different industries and program structures they represented. As work progressed and everyone became better acquainted, the similarities between the programs became far more striking. Each team struggled with how best to introduce ideas to other teachers and to get buy-in from the other teachers who would be involved. All searched for common planning time, which was sometimes as elusive as the Holy Grail. At times, goal overload threatened to swamp each effort.

In the course of the collaborative initiative, it became clear that the four teams shared a great deal—not just with one another, but also with academic reform efforts. All of the sites were trying to create, or had created, small learning environments. In all four cases, AAI efforts interwove with vocational and academic integration. The schools utilized a range of experiential and field-based learning settings such as service learning, apprenticeships, internships, and school-based enterprises. To gain some insight from other education reformers employing these strategies, the final chapter in this book investigates and elicits advice from seven complementary reform efforts: The Coalition of Essential Schools, the Center for Collaborative Education, the Philadelphia Schools Collaborative, Service Learning Programs, Foxfire, REAL Enterprises, and City/Community-as-School.

None of the efforts documented in this book are "over." All of the teachers continue to adapt, expand, enrich, create, and perhaps most importantly, to question. The most valuable impact of AAI as a concept may well be as a catalyst and a tool for probing for what we—educators, students, parents, community members, employers, policymakers, and others—want from our schools.

THE OAKLAND HEALTH AND BIOSCIENCE ACADEMY

Abstract

In this case study, readers are introduced to the Oakland Health and Bioscience Academy. The authors paint a rich picture of academy life and illustrate how AAI can be grafted to existing efforts. At the same time, they also portray how AAI unites many elements of a complex academy life from projects, to work-based experiences, vocational and academic curriculum, and industry mentors. As they tell it, AAI provides a nice framework on which to hang many student activities and bring coherence to the many academy features.

Because this academy has been under construction for ten years, this team found it impossible to pick one particular feature of its program to showcase AAI. Therefore, readers are treated to a comprehensive picture of academy life with careful attention paid to how AAI seeps out of everything that the academy does. In this way, Oakland presents both the richness and complexity of AAI as it becomes deeply infused into a program. Readers are also treated to concrete examples of how to use AAI in various activities.

GRAPPLING WITH ALL ASPECTS: THE OAKLAND HEALTH AND BIOSCIENCE ACADEMY

by Patricia Clark, David Deleeuw, Erin Flynn (JFF), and Jennifer Yates

Additional Team Participants:
Michael Allerton, Patricia Bayonne-Johnson, and Marlysis Piver

> I tell you one thing, if you learn it by yourself, if you have to get down and dig for it, it never leaves you. It stays there as long as you live because you had to dig it out of the mind before you learned what it was.
>
> —Aunt Addie Norton

Introduction

The Oakland Health and Bioscience Academy began operations in 1985 in response to the critical need to increase the number of underrepresented students successfully pursuing careers in health, medicine, life science, and biotechnology. We are a school-within-a-school at Oakland Technical High School and a career magnet program for the Oakland Unified School District. Academy students spend up to 80% of their day in interrelated academic and lab classes for an intensive three- or four-year period. Students also participate in health and bioscience worksite learning experiences that include service learning placements, career explorations (interactive job "shadows"), clinical rotations, paid summer and senior year internships, community development projects, practica, career exploration portfolios, academy Senior Projects and exhibitions, demonstrations of mastery, and so on. From its inception, the goal of the academy has been to foster the interest of students in health and bioscience careers and to provide the breadth and depth of educational experiences needed so that students are well-prepared for high-quality health/bioscience careers, for postsecondary and lifelong education, and for healthy and proactive citizenship.

For several years, academy teachers have worked together and have had technical assistance from Far West Laboratories, Jobs for the Future, the California Department of Education—Health Careers Division, the California Partnership Academies, NCRVE, and others to increase the use of portfolios, projects, problem-based learning, and performance assessment. As a team, we strive to integrate curricula—the technical and the academic, secondary and postsecondary—around health and bioscience themes. Our primary focus is on providing a powerful learning experience for students; our methodologies emphasize increased student ownership of the learning process. We foster students as active learners, thinkers, and makers of meaning and foster student commitment to producing quality work. Ours is an ongoing conversation around issues of what it is that we want students to know and be able to do; what conditions promote that knowing/doing; how to best connect school, work, and community; how to assess complex learning, mastery, and student performance; and how to best organize ourselves as a learning community in which students, teachers, industry and postsecondary partners, parents, and community work together. The academy is a place where students are encouraged to use their hearts, their hands, and their minds well.

As a school-within-a-school, we face many challenges. As is true for most teachers, we have impossible demands on our time. Our ideas about how students and teachers should work together and with others have sometimes been difficult to implement within the framework of a traditional (albeit changing) high school. We have strong administrative support, but still fight battles about scheduling and procedures. Many of our students deal day to day with issues of poverty, racism, social injustice, urban violence, and drugs; thus, it is especially important for them and for us not to focus on deficits and excuses, but to, instead, view each student as a community resource and as a potential creator of high-quality work; to build on strengths; and to always expect and support excellence from all.

All Aspects of the Industry: Where We Started

In October 1994, we were invited to participate in a project funded by the Joyce Foundation on developing curriculum related to AAI. Our research team consisted of four academy teachers; one community college radiology instructor, who is part of our Tech Prep partnership; one health educator from our Kaiser Permanente partnership; and facilitators from Jobs for the Future and NCRVE.

One of the first things that became clear to our team members as we thought about implementing AAI in our curriculum was that we were not entering uncharted waters. Many AAI concepts were already embedded across the academy curriculum and in the reflective writing which accompanies students' work-based learning experiences. We work hard to broaden our students' perspectives about health and bioscience using history, literature, drama, and ethics. Student projects and portfolios have assumed an increasingly important role in the academy and are vehicles for direct student exploration of the industry. An expanding relationship with our industry partners continually creates new work-based experiences for students and teachers, but also requires that we find better ways to flesh out the learning potential of each new worksite, further connecting school and work.

In a more fundamental sense, many of the convictions and commitments we began with as a Partnership Academy already directed us toward AAI:

- We began with a commitment to accepting a full range of students interested in a wide variety of health and bioscience careers. We wanted to attract students by interest, rather than by their perceived skill or ability. While the majority of academy students enter the program performing below grade level academically, our goal was to emphasize potential and avoid labels such as college-bound, noncollege-bound, gifted, or at risk. We planned our courses to meet college requirements *and* introduce students to the world of work. We oriented students to health care and bioscience so that their education would serve them whatever their aspirations, from entry-level jobs such as technicians to doctors, nurses, and scientists. This broad orientation to health care led us to emphasize concerns, ideas, and perspectives that are important in the industry as a whole and common to many occupations.

- We were committed to blending academic and vocational education—the abstract and the applied—and to increasingly becoming much more interdisciplinary and problem-issue–theme focused rather than fragmented and subject-focused. Students learn and act on their own learning, in response to ideas they think are important; they need to combine thought and action, reflection and practice, theory and application; they need to feel that assignments and projects contain elements of a larger, experiential learning cycle. For students to develop a passion for learning, they need opportunities to make meaningful connections among what they learn in school, what is happening in the community, what they are learning at the worksite, and their future career goals.

- From the first, our intent has been to develop health care worksites as high-quality learning places. We wanted work to become more "learningful." Field trips,

> career mentors, service learning, structured career explorations, internships—these contextualized experiences, sequenced through a student's three/four years, would inspire our students and increase their understanding of and engagement with the health care industry. However, we knew that we could not send them into the world of work unprepared. We wanted them to ask great questions, make valuable contributions, and understand as much as possible of what they would see and do. Coaching students prior to worksite learning led us to explore and begin to master not only aspects of technology and medical techniques, but also the structure and sociology of work, safety and environmental issues, bioethics, community impact, the economics of health care, management, planning, and other related issues.

Our Overall View of AAI

In general, we see AAI not only as a set or ensemble of concepts essential to curriculum, but also as a tool that encourages program improvement. We want our students to use AAI to develop systemic thinking about industry and to apply AAI in many projects, including community development. We need to help students build on what they already know; provide a series of increasingly independent opportunities for them to experience, practice, and apply AAI; and then support students as they become expert practitioners in their own uses of AAI. At the same time, we need to use AAI to rethink, assess, and fine-tune the academy. AAI should be a tool for program design, helping us to enhance curricula, workplace and community experiences, and student projects and portfolios so that students can gain useful knowledge about AAI themes and experiences in applying them. We also know that a deep understanding of AAI will result in broad, transferable skills for other career paths our students might pursue.

We redesigned our first year (ninth/tenth grade) curriculum in order to explicitly introduce students to AAI and to explore strategies to deepen students' and our own understanding of each aspect and how—as an ensemble of aspects—they integrated into a coherent system of practice and theory. Students need to encounter AAI in multiple themes, projects, and experiences across the curriculum during the three or four years they are in the academy. As they participate in workplace experiences, including internships and their first health and bioscience jobs, they will use AAI to understand the organizations and systems they encounter. Then, in a series of student-chosen projects and community development activities, students will use ideas for themselves. Since students choose their own topics and methodologies, we can also use student projects as feedback on our curriculum, in AAI and in other areas. Which topics and aspects did students choose to investigate? Are there important AAI themes that are not represented? What learning situations might encourage an even richer student exploration of AAI?

We would add one aspect to the general set. Ethics is a fundamental aspect of our industry (and at least an important one in many other industries). Students must understand bioethics and medical confidentiality before we can send them out to internships. Many of the health care controversies in the news—about the right to die, about who gets transplants, or about universal coverage—are primarily about ethics. Our students are acutely aware that medical care is unequally distributed, and they want to understand, criticize, and change this. Ethics is also powerfully embedded in the literature and history of health and science. We cannot imagine our curricula being complete without this dimension.

What We Did

Over the course of the year, we worked to incorporate AAI into four different elements of the academy. We are still in the early phases of full AAI incorporation, but we have already learned many important lessons that we hope will be valuable to others.

The four areas of incorporation this year are as follows:

1. *Worksite Learning Experiences*

   For several years we worked with Jobs for the Future and others to improve the quality of student career explorations and internships. We had made great progress, but there was much more to do. We were expanding and formalizing our relationship with Kaiser Permanente, our largest local health employer. The previous year's pilot of biweekly worksite explorations (structured visits to clinical and health management departments) made clear that the quality of these experiences was not consistent; we needed teachers, worksite supervisors, and Kaiser employees to work together to develop more powerful, interactive learning. Another partner, Alameda County Medical Center (Highland Hospital), assigned someone from its administrative staff to work with us to improve student internships, work-based projects, and reflective seminars. This administrator was also working with academy faculty in developing health care youth apprenticeships. Other hospitals and community health partners offered additional training and internship placements. These were superb opportunities to use AAI as a set of lenses through which to design quality work-based learning.

2. *Student Portfolios*

   We revised the guidelines and standards for the Work-Based Learning Portfolio, which accompanies student worksite learning experiences, to include a greater emphasis on AAI work samples. Here, students could explicitly apply AAI themes in order to understand particular worksites, and the resulting portfolios produced some of the clearest demonstrations of student understanding of AAI.

3. *Projects*

   We have always emphasized extended student projects and portfolios of various designs, which involve student choice and ownership as essential to learning. We saw projects as a particularly fruitful way to encourage thinking about AAI. What students did with AAI concepts would certainly be interesting, and would contribute both to their own and to our collective understanding of AAI. This year, we reworked an introduction to a Health-Care Delivery Systems Project for our tenth graders, added additional guidelines and ideas for work samples to both the student Career-Technical Assessment Portfolio and the Work-Based Learning Portfolio criteria, and expanded a six-week Senior Project into a Senior Project spanning many months. We will present some of the dilemmas, choices made, and results in using projects to develop and demonstrate a student knowledge of AAI.

4. *Postsecondary Articulation*

   We are working toward formal health and bioscience career pathways in partnership with several hospital partners and the local community college district. One of our community college Tech Prep partners added an AAI component to her advanced radiology course and worked to foster an understanding of AAI among her colleagues.

Organization of the Case Study

This case study is organized around the four areas delineated above. The material which follows describes where we began and how academy curricula and learning experiences were perceived and reworked to further incorporate AAI. Various sections were written by different members of our team. As a result, individual parts may reflect slightly different voices, experiences, and learning. We conclude our case study with some general conclusions about the important role AAI has to play in building strong school-to-career programs.

Some Advice for (Some of) Our Readers

Some of you may read this introduction and feel that, while what follows might be interesting, it will not be useful to your program because you face a very different set of circumstances (i.e., "It was easy for *them* to implement AAI—they were already doing all of this"; "Our program is only starting"; "I'm one teacher with one class"; or just "Our school/program is very, very different from what you've described"). Throughout our case study, we have tried to distinguish between a variety of approaches to incorporating AAI into curriculum and to identify likely starting points. We hope that one or more will be useful to you at whatever your school's/program's/system's stage of development.

We believe that the broad principles outlined above (an industry rather than occupation focus, curriculum integration across disciplines around broad-based career themes, student-driven projects, systematic workplace exposure) mutually reinforce AAI. Your strengths in any of these should provide a strong base for AAI implementation.

What we present in the following pages may make academy activities sound highly organized and completely thought through; the reality is somewhat more chaotic. We did not become the program we are today overnight. We have brainstorms and then try new approaches, succeed or fail, rethink and refine, and try again. Opportunities for working with health industry partners emerge and we scramble to make them work. Different individuals or teams of teachers and students assume responsibility for various program components and/or concentrate on elements of what we agree to do. New partners join us with fresh dreams of what they hope to accomplish. Sometimes a particular teachers or an industry partner takes us in new directions. Sometimes students or parents lead the way. There is never enough common meeting time. We tear our hair out, laugh, yell, and console one another in empty classrooms after school. Some of our deepest conversations take place in hallways and parking lots or late at night over the phone.

The way the program can grow and stay coherent in this chaos is through our common vision. Every year (there have been ten of them now), we rethink our ideas of what school should be; of how students and teachers can and should learn; and of how best to connect school, work, and community. We factor in external demands and come to a consensus on particular elements that need our attention. We chose these elements carefully with an "any stone that hits less than two birds is rarely worth throwing" approach. Through this process, we develop or reaffirm guiding principles about what we are trying to accomplish each year, which are understood by everyone involved, and come to some agreement about priorities. We attend conferences and work together in the summer to develop our agreements and plans and to orient new staff members. We write curriculum together, but the reason that it gets implemented at all is not primarily that something is down on paper, but because the larger ideas are in our heads.

Many of you may object that it is already a struggle to fit what students need to learn into the time available without adding in AAI or student projects and portfolios. Some of us felt that pressure when we started, but we all agree that, "You'll get over it! Learning about all aspects is worth any additional or initial effort." A curriculum infused with AAI includes the intangibles that knit everything together. AAI shapes our collective thinking and provides an imperative for learning. This process has led to an increase in what students really understand and master because they are more engaged with what they do study. Administrators, teachers, parents, and other visitors to the academy are impressed with the high quality of work that students are doing, and with the palpable energy and excitement they find, rather than worried about particular lectures or multiple-choice tests that are missing from the class structure.

AAI should serve as an interrelated set of guiding ideas (where the whole is always more than the sum of its parts) that gives the academy coherence—coherence for students, so that different learning experiences relate to one another; coherence for staff in the midst of the stress, turbulence, and joy that is teaching; and coherence through time to ride over staff changes, schedule changes, fresh opportunities, and new challenges and arrive at the other side—a richer and better community of learners.

Student projects, career-technical portfolios, and Work-Based Learning Portfolios can add significant AAI content and experience to a class or program even if you are not yet ready to rethink your entire curriculum. For us, these projects and portfolios have also been important in drawing teachers into integrated and student-centered approaches. They can be used as a relatively easy means for a team of teachers to work together, and there is not a more eloquent way to persuade teachers than for them to experience the pride, thought, energy, and effort students put into projects and portfolios and the powerful student learning that results.

Incorporating AAI into Student Worksite Learning Experiences

As noted in the introduction, the academy began with a commitment to developing health care and bioscience worksites as places for students to actively learn. We took to heart the idea that schools should become workplaces and workplaces should become schools. Local hospital and postsecondary partners played a critical role in enhancing worksite learning, and technical assistance was provided by Jobs for the Future, the Career Education Office of the Oakland Unified School District, the California Partnership Academies, the Health Careers Division of the California Department of Education, Far West Laboratories, the Center for Law and Education, the NCRVE, and others.

Several of our hospital partners had already designed student worksite learning experiences to reflect SCANS and AAI, though they may have used slightly different terminology. For example, academy students enrolled in the Regional Occupational Program are student interns at Alameda County Medical Center and rotate through a number of departments, including EKG, medical laboratory, surgery, admitting, and the medical staff office. These rotations broaden student experience and provide opportunities for training in a range of occupations and departments. The student-rotation design stems from the medical center's need for cross-trained, entry-level employees to meet current and future hospital needs. Additionally, as part of their internship experiences, students attend weekly seminars which are facilitated by medical staff, including administrators, doctors, nurses, technicians, and others. They also complete Work-Based Learning Portfolios and major work-based projects, maintain internship journals, and spend time sharing and reflecting on their growth toward mastery and their learning processes.

Citywide, the Oakland Unified School District is encouraging all employer partners to embrace the AAI framework by specifying the broad range of skills summer and senior year internships should include. Recently, the district brought together educators, parents, and industry partners to develop a *Work-Based Learning Agreement* that specifies roles and responsibilities for interns, schools, employers, and parents; and a *Work-Based Learning Plan* that specifies the competencies interns are expected to master. Competencies range from work ethics and values to interpersonal skills, basic skills, higher-order thinking skills, and AAI. Individual Training/Education Plans are developed and assessed by teachers, students, and employers working together.

In this section of the case study, we provide an overview of the worksite experience and learning that is integral to the design of the academy. Then we consider the Health Academy's partnership with Kaiser Permanente and how AAI is used to enhance the career exploration program and internships which take place at Kaiser Permanente. The evolution of the interactive job shadowing program, enhanced internships, worksite coaching and seminars, and cross-training approaches at Kaiser Permanente provides an excellent example of how schools and their employer partners can work together to structure learning experiences that provide students with a comprehensive understanding of industry.

Overview of Worksite Experience and Learning

In partnership with over twenty-five health care and bioscience employers, the academy offers students a plethora of opportunities to apply concepts they are learning in school to different work settings. Through a series of sequenced, structured workplace experiences, students establish relationships with health care professionals, are exposed to diverse health care careers and workplaces, learn about workplace dynamics, and gain hands-on work experience in the health care field.

The work-based learning sequence within the Health Academy is designed to provide students experience in and understanding of all aspects of the health care industry over the three- to four-year academy learning progression. At each stage, work-based learning experiences are complemented by class assignments that require students to demonstrate their knowledge and ability to make sense of how different aspects of the health care industry fit together. In addition to informing the overall design of the work-based learning sequence at the Health Academy, AAI provides a useful tool for organizing and structuring the specific work-based learning activities students engage in with employers. As the academy work experience has evolved from offering basic summer jobs to offering high-quality, structured work-based learning experiences for students, AAI has provided an important framework for teachers and health care managers and supervisors who work together to design cogent experiences for students at the workplace, and to forge needed connections between the workplace and school.

The sequenced nature of the work-based learning experiences provides students with a gradual introduction to workplace dynamics and culture. During their sophomore year, students are matched with industry mentors (adults who work in health or bioscience) with whom they meet at least once a month in person and maintain weekly contact. In addition, each sophomore performs seventy to one hundred hours of service learning related to the health/bioscience focus. During their junior year, academy students participate in a worksite exploration program in which students rotate through a series of clinical, business, and administrative departments at various health facilities. During the summer between their junior and senior years, students work at a paid internship with a local health care employer. Many students also participate in internships during the second semester of their senior year and in the summer following their senior year. Each student intern is matched with an industry mentor/coach who can help students address questions and concerns that arise through the work experience. Education/Training plans designed to provide students with both broad and job-specific skills have been developed for the internship positions by teams of educators, employers, and employees. And, again, student interns also maintain journals, complete special projects and portfolios related to their internships, and participate in reflective seminars.

Kaiser Permanente

Kaiser Permanente is a nationally recognized Health Maintenance Organization (HMO) with 238 medical facilities/offices located across the country. Kaiser's National Headquarters (Program Office) is located in Oakland. In addition, Oakland is home to Kaiser's Northern California Regional Office and to one of fifteen medical centers in California. Together, these three Kaiser locations employ more than 4,000 people, making Kaiser Permanente one of the largest employers in the city.

Throughout California, Kaiser Permanente has a long tradition of community involvement and collaboration with the public school system. For twenty-five years, Kaiser Permanente has employed Oakland youth through its Summer Youth Program. Kaiser Permanente's Summer Youth Program is associated with a citywide summer youth employment effort in Oakland commonly referred to as the Mayor's Summer Youth program which seeks to provide Oakland youth with summer jobs.

The Kaiser Permanente–Oakland Education Initiative

Kaiser Permanente began a partnership with the Oakland Health and Bioscience Academy in 1985—the year the academy was established. Through the partnership, Kaiser representatives became actively involved on the academy's advisory board, providing the Academy with oversight, financial support, instructional supplies, expertise, and resources. In addition, Kaiser provided field trips and summer jobs for some Health Academy students. In 1992, Kaiser Permanente started a new partnership with the Health Academy and included the Health and Environmental Science House located at Fremont High School in this partnership. In partnership with these two schools, the Kaiser Permanente–Oakland Education Initiative was formed in 1992.

The mission of the initiative is to support and influence educational reform in Oakland by strengthening the link between classroom learning and the transition to advanced education, careers, and citizenship. In partnership with students and teachers at Oakland Tech's Health Academy and Fremont High School's Health and Environment House, Kaiser Permanente seeks to expand the opportunities for low-income and minority students to enable them to continue their education in order to compete successfully in an increasingly technological job market. To this end, Kaiser provides a wide variety of school-based, work-based, and connecting activities for students at both schools, including speakers, career awareness material, mentoring, volunteer opportunities at the hospital, research advisors, tutoring, job shadowing/rotations, summer jobs, and internships.

The initiative is governed by a steering committee which has representatives from Kaiser Permanente's Program Office, Northern California Regional Office, the Oakland Medical Center, the Oakland Unified School District, principals and teachers from the Health and Bioscience Academy, Fremont High School, and a representative of Service

Employees International Union Local 250. Over the past two years, the steering committee has worked to integrate technical and academic curricula at both schools with work-based knowledge and experience of all aspects of the health care industry.

Designing the Worksite Exploration Program To Encompass All Aspects of the Industry

One of the first goals of the initiative was to determine how to make student worksite experience more "learning centered." While Kaiser had provided summer jobs to Oakland youth for years, these jobs were not structured as learning experiences in any systematic way. Given the rapidly changing labor force needs of the health care industry, the steering committee agreed that student worksite experiences should provide students with broad exposure to the health care industry. Drawing on a network of innovative school-to-work transition programs in health care both in California and nationally, the steering committee assessed different models for structuring students' worksite experiences.

In the fall of 1992, the steering committee began planning a pilot worksite exploration/job rotation program to "expose students to the variety of positions that are involved in the delivery of health care and assist them in understanding how the information they are learning in school is applied to the workplace." The steering committee recognized that job rotations were particularly well-suited for engaging students in AAI because the rotation could simultaneously expose students to all aspects within a single department and to the clinical, administrative, human resource, legal, and business aspects of the health care industry. In addition, the steering committee felt that a job-rotation program would be excellent preparation for summer jobs between the junior and senior years of high school that students need. The job rotations could help students make informed decisions about what department they would like to work in over the summer and could provide student workers with a strong sense of how their individual departments fit into the overall Kaiser Permanente structure.

The Pilot Project

Departments from all three Kaiser locations volunteered to participate in the pilot project launched in the spring of 1993. From the beginning, the steering committee believed that department participation in the job-rotation program should be voluntary to ensure that departments were committed to providing students with a quality learning experience. To engage departments, memos were sent to department managers at the Program and Regional Offices and to the medical center which stated the goals of the program. Administrators responsible for program development at each Kaiser location targeted department heads who participated in the Summer Youth Program in the past as well as those who had expressed interest in working with young people. Departments expressing interest were required to develop learning objectives for students participating in the job rotation (department contacts were provided with sample learning objectives for job rotations from Project ProTech—a Boston-based school-to-work transition program in health care—and from the Cornell School-to-Work Project). Altogether, twenty departments and sixty students participated in the six-week job-rotation pilot program.

Overall, the spring pilot program was successful. Most supervisors said they would participate again, and students enjoyed the opportunity to learn about health careers. Feedback from department supervisors and students indicated, however, that several areas needed improvement to make the program more successful in the fall. In particular, it was clear that departments that participated in interactive exchanges with the students were the most successful; that additional assignments, scenarios, and criteria for portfolio work samples were needed to help students link their school experience with the job rotations in a systematic way; that one visit to a department was not necessarily enough for a student to develop an understanding of its role in the overall system; and finally, that scheduling between the schools and Kaiser needed to be better coordinated.

Fine Tuning the Program

The fall job rotations began in November 1993 and continued through the spring of 1994. All of the eleventh-grade students from both schools (approximately 120 students) attended an orientation session and received binders containing job descriptions from each of the 26 participating departments. Over the course of the year, each student visited between four to nine departments. Job rotations took place every other Thursday.

Kaiser Permanente hired a health care education consultant to assist department managers and supervisors in developing interactive job-rotation experiences. The consultant also met with faculty at both schools. Over the course of the year, program fine tuning revolved around several key concerns: integration of classroom learning with career exploration/job-rotation learning (including pre- and post-activities, assignments, and reflection); scheduling; department assignments; student preparation; participant expectations; and issues related to assessment, evaluation, and follow-up.

The following program developments have helped address implementation issues over the course of the year:

- *Work-Based Learning Portfolios*
  Oakland Health and Bioscience Academy teachers developed a Work-Based Learning Portfolio to encourage students to process, reflect on, and demonstrate growing mastery of what they were learning about health care, the nature of work, specific career skills, and (in a global sense) the interconnectiveness of all knowledge through their job rotations. The portfolio emphasizes employability skills, AAI, and the emerging health care standards *and* requires students to create work samples upon completion of each job rotation to demonstrate their knowledge of workplace culture and dynamics, as well as specific departments.

- *Preparation of Interactive Job-Rotation Sessions for Students*
  Kaiser's health care education consultant met with department managers at the Regional and Program Offices to help them design interactive job shadowing experiences for students.

- *Meetings Between Teachers and Department Supervisors*
  To facilitate communication between teachers and department supervisors, Kaiser's health care education consultant facilitated a meeting in the spring to begin to integrate the job rotations more systematically into the academic curriculum. This meeting also helped to clarify the expectations, roles, and responsibilities of teachers, students, and supervisors. Teachers and supervisors continue to meet on a regular basis to work on program design and toward ongoing improvement.

- *Teacher Job Rotations*
  In June, teachers from both schools participated in job rotations at the Central and Regional Offices and the medical center. Teacher job rotations were developed to

provide teachers with hands-on experience to enable them to integrate the job-rotation experience into the academic curriculum.

As the Career Exploration/Job Shadowing Program wrapped up toward the end of the school year, Kaiser Permanente administered an evaluation to students, teachers, and supervisors involved in the job rotations. Feedback from the evaluation will help the implementation subcommittee improve next year's effort. In preparation for next year's Career Explorations/Job Shadowing, teachers and department supervisors will continue to meet to integrate and enhance curriculum; teachers will continue to participate in job rotations and summer teacher internships (which combine workplace learning and related curriculum development) to further familiarize themselves with the workplace; and industry partners will spend more time working with students in classrooms and on projects.

Fine-tuning of the program is naturally an ongoing process. Over the past year, however, several important mechanisms were put in place to incorporate or embed fine tuning into ongoing operations. Overall, the steering committee can be proud of its accomplishments—a strong working partnership between the two schools, Kaiser administrators, department managers, and Kaiser employees has been established; teachers and supervisors will be working together to develop integrated linkages between the worksite experience and school assignments; and students are gaining the exposure to the workplace they need to begin their summer internships with a broad understanding of the industry they are entering.

Using Student Portfolios To Reflect an Understanding of AAI

> A portfolio is a purposeful, integrated collection of student work showing effort, progress, or achievement in one or more areas.
>
> —Northwest Evaluation Association, 1991

Several academy teachers have long been advocates of the use of student portfolios. With an almost missionary zeal, they have encouraged their use throughout the academy. While not every academy teacher uses portfolio assessment, most now do, and students develop portfolios in English, history, science, and math, as well as developing

Work-Based Learning and Career-Technical Assessment Portfolios. We gradually refine our own standards and performance criteria for both small portfolios and for an all-encompassing academy portfolio which students begin when they enter the academy and which they carry with them into their adult futures.

We were fortunate to work with the San Francisco-based Far West Laboratory to field test Career-Technical Assessment Portfolios (C-TAP), Projects, and Scenarios. Our involvement with the C-TAP enhanced our understanding of the power and potential of portfolios and raised the level of the discussion both among teachers and between teachers and students about learning processes and assessment. The Far West Laboratory C-TAP requires the following:

- ***Introduction*** which includes a table of contents and a letter in which students present themselves and their portfolio work
- ***Career Development Package*** which includes applications for employment and college, a cover letter, a résumé, and letters of recommendation (the academy also requires a Career I-Search and an Individual Career Plan)
- ***Work Samples*** which showcase important demonstrations of mastery of career-technical skills (each work sample is introduced by reflective student writing which provides a summary of knowledge and skills demonstrated, of the learning processes involved, and a self-assessment with regard to quality and growth. Work samples are tied to Health Care Standards as well as AAI and SCANS)
- ***Research Write-up*** which investigates a health/bioscience topic or issue
- ***Supervised Practical Experience Evaluation*** in which an employer/supervisor evaluates a student's worksite career development

Additional samplings of academy projects included in the portfolio are lab work, student-produced health education newsletters, service learning, public health and community development projects, journal entries, and special multimedia projects. These projects are not in the basic Far West Laboratory design but are part of the academy requirements.

Students begin a C-TAP in the tenth grade, but complete the bulk of their work samples and academy career practice in the eleventh grade. In their Junior Academy

English classes, students spend time refining their C-TAPs, and then use them to showcase the knowledge and skills they have mastered and the work they can do. Students present their portfolios to prospective employers when they interview for Academy Summer Internships. Most students personalize their portfolios. Student include photographs of themselves at the worksite, projects they have done, copies of their transcripts, letters of appreciation, samples of interdisciplinary projects, certificates of accomplishment and mastery (e.g., First Aid, CPR, medical terminology, computer applications and so on), community service awards, perfect attendance awards, student-produced pamphlets and newsletters, research write-ups, their best work related to health or bioscience from their classes, and more. They often design special covers and add plastic cover sheets and fancy indexes. We emphasize the creation of a professional product which will have future supervisors and employers (and perhaps postsecondary institutions) as its audience.

Over the course of last year, we began to use portfolios to explicitly explore AAI. With student assistance, we developed clearly stated definitions and examples of each of the aspects of industry and then asked them to create portfolio work samples which demonstrated their knowledge, understanding, and application of these specific aspects in the health care industry. We also developed a Work-Based Learning Portfolio requirement for students engaged in direct inquiry into various aspects of the health industry in the context of a medical center and a major health maintenance organization facility.

The academy's Work-Based Learning Portfolio accompanies the structured Career Exploration experiences that eleventh-grade students have at Kaiser Permanente Medical Center and Kaiser Permanente Regional Offices (previously described). Each student's Work-Based Learning Portfolio tells the story of his or her work-based learning experiences. Work-Based Learning Portfolios include field notes, journal entries, interviews, work-based learning assignments and projects, evaluations, and records of mastery, as well as specific AAI work samples. Work-based learning has always been an essential component of the Academy experience; however, in the last few years, the strengthened partnership with Kaiser Permanente has offered students and teachers amazing opportunities for connecting school and work on a regular and ongoing basis. Eleventh graders can spend a full or half day every two weeks in structured, interactive

Career Explorations (job shadowing experiences) in which students use a portfolio approach to focus their learning.

Demonstration of AAI knowledge through the Work-Based Learning Portfolio can take many different forms. For example, a student might use several visits to the Neonatal Intensive Care Department to explore the management structure of a clinical department or how that particular department uses planning. Or a student might do a photo essay on health and safety precautions in the genetics lab as part of an AAI work sample. Or a student might interview a lawyer from the Kaiser Permanente Legal Department about the legal aspects of medical ethics and then respond to a case study the department provides. Students look at everything from accreditation to facilities management to nutrition to social services. Students explore the hospital as one might a city, except that they are better prepared than most travelers and have excellent guides in their worksite hosts, teachers, and in the structure provided for the career explorations.

We were pleasantly surprised by the strong sense of professionalism and efficacy that students brought to the Work-Based Learning Portfolios. They approached the AAI requirements with a clear sense that what they were being asked to do built on what they already knew and was worth doing. A few students complained—as students sometimes do—about the quantity of work expected, but all of the students felt that the work they did both increased their knowledge and understanding of the health industry as a whole *and* allowed them to demonstrate what they learned at the workplace. By building in opportunities for students to reflect on the learning process and make assessments of themselves as learners during their career exploration experiences, we were able to witness the students as they sought to create patterns, articulate their thinking on complex experiences, internalize AAI criteria, and navigate a course from novice to mastery. Some of what we required of them was overwhelming; some was too structured, but the combination of portfolios, projects, and reflective seminars as strong connectors for the classroom and the worksite had impressive payoffs.

We are still in the pilot stage of the Work-Based Learning Portfolio. One of our challenges is to develop an assessment rubric for Work-Based Learning Portfolios that honors the uniqueness of each student's learning experience and simultaneously documents the part that career exploration plays in a student's progression from health career novice to health career expert.

Lessons Learned

- We walk a delicate line if we use prepackaged materials and/or too formal requirements for student portfolios. Exploration and the spirit of student ownership and empowerment need to guide our work.

- We need to balance the use of portfolios for assessment with their use for instructional purposes. Purpose affects design. Assessment portfolios tend to belong to the institution, to be more structured, to use performance criteria to monitor student growth, and to require more teacher and employer management; instructional portfolios tend to belong to the student, to be less structured, to use performance criteria for student self-reflection, and to require more time and management skills for students. Possibly the best portfolios are combinations of both.

- We cannot underestimate the value of clearly stated, quality performance criteria for AAI entries in the portfolios and the importance of teaching students how to use these criteria in helping to shape the work they do.

- We need to approach portfolio design and assessment as a "community of learners" and to engage teachers, students, employers, employees, and postsecondary institutions in the process. Only by doing so can we assure that employers and colleges value the student work and portfolios that result.

Student Projects and AAI

Overview

We reworked two major student projects this year, one for tenth graders and another for twelfth graders, to further incorporate AAI. (Academy students had previously completed similar projects, but without the explicit AAI content.) As we said in our introduction, the work we do with students is perpetually evolving; progress comes sometimes in leaps—often in steps—and sometimes in "directed" spurts as a new idea of new process takes hold. The tenth-grade project is an introduction to the industry in the first year; the twelfth-grade project is a demonstration of mastery prior to graduation. The projects have different goals and require different approaches to using an AAI framework. We chose to consider the Senior Project in greater detail, not because it shows the "best" application of AAI, but because it shows some of the dilemmas of applying AAI to something which also has many other purposes.

We begin this section by presenting reasons why projects are important to the learning culture of the academy and why project-based learning is a powerful methodology in which to have students develop AAI skills and knowledge. We then present the organization and sequence of projects throughout the three years. We provide descriptions of small projects that students develop in particular classes, as well as the major crosscurricular student projects for each year. Finally, we present our work on the Senior Project as a more detailed case study. This order of material also allows us to show the progression of projects in our program, from the first year to the third, from simpler and shorter to longer and more complex, and from where we started to where we are now.

Themes that we feel are critical to successful projects reverberated throughout our work over the course of the year: *industry partner participation, student choice/ ownership, emphasis on quality and craftspersonship, connections with community, and belief in the importance of active learning and opportunities for reflection.*

One of the keys to creating projects with AAI content is to bring industry partners into the process. They can provide knowledge about industry that teachers may not have and they help students know that what they are learning and doing has relevancy. Throughout this section, we try to suggest the variety of ways in which this can be accomplished.

Learning through projects is powerful, in part, because it allows greater scope for student choice than more traditional assignments do. At the same time, there are often particular student outcomes (such as knowledge of AAI) that we want to encourage. A positive interface between student choice and project criteria requires careful planning and design. Tasks that are too hard or too easy, too open or too closed, rarely stimulate maximum learning for students. What needs to be negotiated, in what areas, with what requirements is always key in project design. Again, we will try to suggest a variety of different possible approaches.

Reasons for Projects

The Oakland Health and Bioscience Academy began turning to large-scale student projects, weeks or months in the making, for a number of reasons:

- *Student Ownership*
  When students choose important aspects of what they are doing and respond to questions that are meaningful to them, when students are engaged in real exploration, when students produce tangible products, and when they are not doing the same thing as everyone else, what students learn from this approach becomes theirs in a way that material from a more traditional curriculum does not.

- *Course Integration*
  Doing projects was a way to have several academy classes direct time and attention to a common goal. Integrating curricula is desirable but takes time to achieve; cross-curricular projects provide natural ways for classes to work together in order to investigate the same topic or theme from several perspectives.

- *Broad Skill Development*
  Projects can both challenge and satisfy all students. They call upon many student skills—technical, creative, and interpersonal, as well as academic.

As a vehicle for AAI, particular features of project work stand out:

- Projects are more "work-like" than a traditional curriculum project would be. They have a series of stages for their completion and require planning and teamwork.

- Projects complement the available resources of our employer partners. Small groups or individual students can visit departments or interview industry experts at the worksite or over the phone.

- Experience with projects of all types prepares students for activities in which they can produce professional-quality goods or services. These "student enterprise" projects in turn have a special relationship to teaching AAI; they *require* the consideration of and concurrent application of many different aspects if the enterprise is to succeed.

- Finally, projects combined with work experience allow students to go beyond "knowledge of" to "experience with" all aspects of their industry. Opportunities for contextual learning and industry experience are essential for creating student portfolios that are valued by potential employers or internship supervisors. Documentation of quality industry experience is also essential for convincing employers that graduating from the academy means something in terms of employability and health career skills. And industry experience is essential for student confidence—about themselves and about their emerging career choices. Knowledge about and experience related to careers can show students interesting possibilities; often it is only by *doing* something that students can affirm, "Yes, this is what I want to do with my life!"

Projects are not an entire curriculum in themselves; however, they make up a spectrum of activities that help to create a culture of accomplishment in classrooms, at the worksite, and in the community. Project-based learning is equally valuable in bringing the different pieces of a program together for students and teachers. Projects enable students to apply their personal knowledge and interests, their growing career-technical mastery of health care, and their academic and technical talents to major work experiences. Participating in a project-based curriculum changes the learning process. Projects place students at the center of the action as active makers of meaning, while teachers move from lecturing to coaching and from "doing to students" to "doing with and learning with students and industry partners."

At its best, project-based learning, which includes a strong component of reflection, increases students' effective problem-solving skills, develops lifelong learning skills (students learn how to learn), increases students' sense of personal and collective power, promotes higher-level thinking (students engage in systems-thinking, including analysis, synthesis, and conceptualization), and links academic skills to direct student experience.

Project Sequence and Organization

We have a sequence of major projects spanning the three years of the program. Students complete several large projects during the tenth grade, including HealthWorks, a major introductory project; Health Educators, a major project in the eleventh grade; and a yearlong intensive "rite of passage" Senior Project. In each case, student choice and ownership are encouraged and reflect the varied workplace and life experiences of the students. In addition to large projects, there are many small interdisciplinary projects as well as projects specific to particular courses. These, too, provide excellent opportunities for exploring AAI concepts. Experience working on many smaller projects and with their service-learning placement prepares students for success with the major, self-directed projects.

Ideally, all academy student projects, small and large, fit together as a gradual and natural progression of knowledge and skills for students. Some of the axes of this progression are the degree and type of student choice, the degree of student choice and ownership, the degree of independence and responsibility, the ways in which industry partners are involved, and the usefulness and professionalism of the final product.

Organization of Small Projects

Small projects take many forms. In Biology, students create elaborate evolution timelines on several meters of paper. (This is an individual rather than a group project.) In Biology Lab, students engage in a career search and create a pamphlet or newsletter about the health career of their choice. In Physiology, students begin the year by interviewing relatives to develop a family medical history. In English, groups of students prepare dramatic responses to health care scenarios. In senior Economics classes, student teams work with city-planning graduate students to produce redevelopment plans for actual city projects.

Student experience with projects can be a springboard to community service projects. For example, we are currently developing a health-focused, service-learning literacy project which will engage academy students in working in elementary classrooms and at Children's Hospital as readers, actors, puppeteers, and storytellers. A student-run Health Education Center is also in the planning stages.

Many of the most useful of these small projects for teaching AAI are supported by occupational simulations or actual case study methodologies as ways to infuse content; students are asked to take on the role of a particular health practitioner, to review the kind of information they would actually look at, and then to make the kinds of recommendations for care and treatment that a practitioner would. In Biology, students complete a genetic disease case study which includes interpreting standard diagnostic tests on an individual and counseling the parents about the prospects for subsequent children. In English, students role play and write their response about what to do in a situation in which they are a medical records clerk, and another employee is violating patient confidentiality. In Physiology, students read a case study of a child with lead poisoning, interpret the results of a blood test for lead, and create a medical management plan as though they were public health nurses. Having learned something about lead poisoning, students then perform a risk assessment for lead poisoning in their own neighborhood, as though they were public health outreach workers. In Advanced Biology, student groups work on a "simulated patient" exercise originally designed for medical students. These simulations and case studies, if structured well, present many opportunities for students to learn about AAI, about particular health occupations in relationship to other specialties, about community impacts, and about managing patient situations rather than simply understanding technology.

Organization of Major Projects

Major projects which cut across the curriculum and last several months require some organizational structure. Depending on the school's master schedule and other program needs, the teachers involved may or may not have a common conference period. We rely on working out the major elements of the project in advance, as well as on meetings with one another; with industry partners; and with students over lunch, after school, during inservice days, and at conferences. Some of our best thinking is done in hallways or during fire drills. We know one another's phone numbers by heart.

In our experience, major projects work best when there is at least one home-based class or a double-period home-based block of classes in which a significant amount of class time is regularly devoted to project coaching and work. Here, the basic sequence of the project is organized; notebooks are kept, deadlines are posted, and permission slips for community-based research and meetings with industry coaches are written. Students also work on major projects in other academy classes and outside of school. This baseline of time, expectations, and criteria coordinated in a particular class (or block of classes) allows opportunities to meet with team members or an advisor on a regular basis and creates the circumstances needed for the best projects. In the tenth and eleventh grades, the home-based classes are usually in science, English, or the science lab courses. In twelfth grade, a double period English and Government/Economics block serves as the project base. We also build in some special Project Days when all academy students have full days—or 80% of their day—devoted to project work.

Particular phases of an overall project are often completed, and sometimes independently graded, in other classes. In tenth grade, English classes survey students schoolwide about teen health issues in preparation for the HealthWorks project while academy math classes learn various means of graphically displaying the survey results. In eleventh grade, students hone research techniques and word smith their health education newsletter stories in history and English. Scientific research for Senior Projects earns credit in senior science classes. Each and every academy teacher is encouraged to participate and to allow some class time for work on major projects. Student groups need time to meet; to consult with project coaches and research resources from our industry partnerships; to use the computer lab; to produce their project displays; to practice their presentations; and to brainstorm, process ideas, plan, and reflect. We all learn to be flexible and to maximize opportunities.

Sometimes life in the academy feels a little like a high energy circus—with action, flash, and color in every ring—and we yearn for more coordination time. In our particular academy, teachers have no added academy resource periods, nor do we all share conference periods. We all have extra responsibilities connected with academy work-based and community-based learning, mentoring, parent contacts, student support services, and so on. Our weekly academy staff meetings are agenda-heavy and our Bay Area location attracts frequent outside visitors. We manage by having a clear idea of our overall project design and by emphasizing the importance of planning.

We do receive outside help with student projects. No teacher can be an expert on even half the topics students wish to investigate. We are collaborators, co-learners, coaches, resources, and facilitators. Especially at the beginning of a major project, students need more ongoing support and coaching than we can always provide. We draw on both industry partners and college student tutors. As much as possible, we involve parents. Industry partners, college students, and parents can be part of the classroom dialogue, can be interviewed at work or by phone, and can coach individuals or groups. Once a list of major project topics is finalized, contacts at partner institutions help to match students and/or student teams with volunteer Research Resources (i.e., expert-practitioners). Meeting with students about their projects can be extremely positive experiences for our industry partners, and the requirement that each major project have a Research Resource makes a critical difference in the quality of the student work which results. Industry, community, and postsecondary partners, as well as parents and faculty who serve as judges for project presentations, make adult and professional standards tangible.

Each year, depending on funding and changing district directives, we try to hire college students (usually former academy students) who can assist in classrooms, especially with students who may need encouragement. Other college students come as volunteers. On Project Days and in class meetings, postsecondary students coach individuals and groups. Additionally, they may arrange to meet at times that teachers cannot. They also help with linking students to industry experts and usually meet with the academy teachers involved on a weekly basis.

Tenth-Grade Project: HealthWorks

In the introductory tenth-grade project, called HealthWorks, students explore health care delivery systems by planning various aspects of a "utopian," school-based health clinic. Activities and projects in all academy classes focus on improving access to quality health care at Oakland Technical High and in the larger Oakland community. Each student team must name their clinic and create a logo, complete actual health needs and health resources surveys, develop management plans, design the clinic facilities, form health and environmental safety plans, deal with marketing issues, and choose from a variety of other tasks. (See "School-Based Health Clinic" in the Oakland Health and Bioscience Academy section of the Support Materials.) Biology Lab served as the home-base class for the project. Teen health surveys were organized in English class; students researched ethnocultural health issues in world cultures class; students worked on clinic drawings and models in math; and they developed health education pamphlets in English and biology. Industry partners were invited to school to address key aspects to both small and large groups of students.

Because HealthWorks is an overview of the industry, it needs to be comprehensive. Where would this clinic be? How would it be laid out? What teen health problems would it need to address? Who would work there? What would it cost? How would you convince parents to support it? How would you convince students to use it? How would the clinic deal with patient confidentiality issues? Students are given some choice of which aspects to address, but within fairly prescribed limits; this allows us to require a degree of comprehensiveness about all the aspects of industry which will become less possible as we "scale up" to projects which address specific aspects in-depth and to action-based projects that involve students working in our (soon to open) school-based health clinic and student-run Health Education Center.

An actual clinic opened at Oakland Technical High School in fall 1995. Academy students are involved with health professionals, parents, faculty, and community members in planning for the clinic and Health Education Center, and are part of the ongoing implementation. HealthWorks serves to ground them in a global understanding of all that is involved in planning and running a clinic and enables them to clarify how the particular health task force/research team with which they work is related to the overall clinic design. When the clinic opens, academy students will staff the Health Education Center, and some will be involved as health interns in the day-to-day operation of the clinic. Formal orientation for these clinical positions will become part of the introductory project and already many of the career and technical skills required are part of the academy Biology Lab curriculum.

Eleventh-Grade Project: Health Education Products and Presentations

The eleventh-grade health education project asks student teams to choose a health problem or issue about which they think teens (or another target group—e.g., elementary students or senior citizens) need to become educated. They research their topic; meet with industry and postsecondary experts; receive training in effective health education strategies; prepare a newsletter; develop an interactive presentation; and present to classes at other schools, including our feeder schools, or to an appropriate community audience.

In many industries, student enterprises, where students create real goods or services, can be an important part of an AAI strategy. In health care, we face some challenges in that, while they might like to, our students cannot yet open their own hospital or perform corrective surgery. They can, however, create real health education products and provide a variety of health-related services. Health education projects call on a range of broad academic skills—research; written, oral, and visual communication; as well as a broad knowledge about health care. Our students are well-placed to do effective health outreach; they live in medically underserved communities and are, in many cases, already the "health experts" for their extended families. Health education projects can be productive in introducing AAI themes as community impacts and health planning are central to the projects; and other themes, such as history or underlying technology, usually apply.

From the first years of academy operation, community organizations working on health issues, especially teen health issues, have been interested in having our students do health education and community outreach. A health educator from the American Red Cross trained several groups of students as AIDS peer educators. Each student group worked to develop an interactive, multimedia AIDS education presentation, and on deepening its knowledge about HIV and AIDS, so that the members would have appropriate answers to difficult questions. They then served as AIDS Health Educators for a wide range of audiences and even trained other teens as AIDS Peer Educators. Some of these students continued to do HIV/AIDS presentations for several years, and several have made careers for themselves in health education. The American Lung Association and a local foundation train academy students as anti-tobacco educators. EcoRap, a group trying to raise awareness of toxic waste and other urban environmental problems, arranged a student "toxic tour" of Oakland and then worked with students for several weeks as students produced posters, raps, and dances that were featured in a local EcoRap performance. We are collaborating with the Alameda County Lead Poisoning Prevention Program to develop internships to follow up on the lead poisoning projects mentioned in the previous section. Programs in health and in other industries that are considering these kinds of "student outreach" projects should explore possible partnerships with local advocacy groups, which can often provide information, speakers, and help in coaching student groups, as well as insight into many community needs to which student projects can respond.

For the eleventh-grade project, student teams choose whatever health topic or issue they want, as long as they can justify its relevance to a specific audience. We ask for a comprehensive approach to that particular health topic. Each project has similar specifics and requirements (e.g., scope of the problem, basic medical knowledge, human interest stories, audience participation, preparation for difficult questions, research and presentation responsibilities, and so on). Each team of health educators gets the same flexible cookie-cutter and applies it to their own dough. What needs to be done, and how the resulting work will be assessed, can be made clear at the same time to all student teams, even though their diverse health topics will take them in different directions and will result in varied products and presentations. A talk by an industry partner about effective health education strategies is relevant to what every group must do.

Groups go to the worksite for one or two short meetings with an industry expert. Their final product is presented to their chosen audience, and the best of the resulting products (e.g., pamphlets, displays, and so on) meet professional standards and are displayed and used at school and by community clinics and health organizations.

Senior Projects

We piloted a new Senior Project design this year, and we want to use it to discuss some of the issues that arise in planning projects and in trying to use them to teach AAI (See "Student Projects and AAI" in the Oakland Health and Bioscience Academy section of the Support Materials.) In creating guidelines for a Senior Project, we had to consider some additional expectations for a final project.

- Because students are moving toward the world of work, college, and career, we expect student products to achieve an exemplary quality that merits respect from possible employers and admission officers. (We encouraged students to approach their Senior Projects as opportunities to do the best work they have ever done.)
- Students have more directed interests by their senior year. They have participated in a variety of internships and other worksite experiences. They have more refined career choices. They have different post-graduation plans. We encourage projects that relate to students' workplace experiences and career objectives but that leave room for their own developing interests.
- Students may want to return to a previous project and continue their exploration and development, using their increased skills and additional resources.
- Senior Projects should be more than just a last assignment. We want students to demonstrate not only what they have learned about health care and its many facets, but also the skills in research, writing, understanding society, and using

technology that they have learned in their academy experience. We want them to choose a topic that is important to them; to put their hearts into it as well as their minds. Senior Projects should be a place where it all comes together, for our students and for us.

- Students have learned a great deal in three years. Ideally, Senior Projects provide an assessment of each student's growth and, taken together, an assessment of how well the academy is working.

All of the considerations above require that students have a wide choice of topics and methodologies. Some students might like to explore a particular health or bioscience career; others a health or bioscience issue; still others want to do community health research, outreach, or development. One of our central decisions about the Senior Project criteria was to find a balance of project breadth and depth without unduly constraining student choice of topic and means of exploration. Senior Project criteria were negotiated with students and renegotiated during the course of the year. We pushed for excellence and for sophisticated constructions of knowledge. We provided students with opportunities to realize what they were learning, and we learned from and with our students.

In 1993-1994, we felt that "demonstrating mastery of all aspects" could not really be required in the Senior Project, since this particular class of students was only explicitly introduced to an all aspects curriculum recently. The students had completed both small and large projects in their tenth and eleventh grades but had done so prior to a strong infusion of AAI into our curriculum. We could not and did not want to require that students explore each aspect of the industry with respect to their project. We wanted Senior Project guidelines that would encourage in-depth exploration of some aspects without limiting student choice or making AAI a rigid, artificial add-on.

Senior Project Progress

Early staff discussions on Senior Projects went slowly, reflecting the lack of time and less-than-perfect conditions for launching a major project. Senior year is the least uniform year in terms of what classes students take. Normally, almost all Health Academy seniors are in the two academy English and Government/Economics sections. They are in a variety of science classes, depending on career and academic goals. In

1993-1994, due to a master schedule error, only about half were in the single Health Academy Government/Economics section, leaving English as the only potential core class. In addition, the senior teachers at that time (there have been staff shifts over the years) did not have much experience working with one another. We held an academy faculty retreat before school started to plan major grade-level projects; however, two of the critical twelfth-grade teachers were unable to join us.

The two teachers who did meet about Senior Projects over the summer wanted to start with a smaller bioethics research project to get more experience working together and to increase participation by other teachers. In the end, they were convinced that a trial-scale run of what we really wanted to do was better than a full-scale run of a smaller project that might have to be curtailed as we evolved to full-year or semester-long Senior Projects.

Three of us (the academy director, an English teacher, and a science teacher) agreed that it was worth trying to do a major Senior Project, even though it would be constrained in terms of time (it was already November) and involvement in other senior courses. We agreed that we would modify the C-TAP project design for this project because the academy director and academy senior English teacher were already working with Far West Laboratories and had already agreed to field test their C-TAP project materials. We modified project guidelines to include more reflective learning, a requirement that the final product be of use and/or that project activities benefit the community (however the student defined "community"), and added to or modified other standards. After almost every meeting, delay, new barrier, missed deadline, and disagreement, we would say, "This is only a pilot; we'll learn how to do better next time."

Starting in December, students chose topics; final proposals were due the second week in February, but one group was still changing and "re-finalizing" its topic as late as April. Available class time for work on Senior Projects during the spring was sporadic, but most groups began their research, and all submitted a formal project plan. At different stages, each group or individual met with academy staff several times. They submitted notes, outlines, and journal entries as "evidence of progress." The process of gathering industry advisors for each group began in February, but was not finished until May. (Some technical projects required more than one advisor.) Some groups worked hard from the beginning; others procrastinated. Two weeks in June were given over to final production. Students completed their products, created visual and other aids, and practiced their presentations. Students presented their projects in lieu of a final exam in Senior English class. The presentations were each judged by a teacher, a student, and an industry partner.

The Senior Project Committee (same three staff, interested senior students, and other senior teachers) met often enough at odd lunch times just to stay barely ahead of working out the details for each stage. Senior academy teachers who missed meetings were contacted about project day schedules and about advising particular groups.

Encouraging AAI Themes in the Senior Projects

Early discussions within the Senior Project Committee centered on how to formulate topic, product, and presentation expectations that encouraged the essential learning and applications of knowledge we hoped for. We all agreed that students should be encouraged to use health care jobs and internships as a springboard for their projects. We also agreed that we wanted the projects to reflect breadth, not just technical material. We agreed that our primary concern was not to exclude valid and interesting topics because of artificial requirements; a major form of argument was to give examples of wonderful projects that did not fit our working draft of criteria and this pushed us to refine and re-refine our benchmarks. We discussed, and fussed, and changed, and reflected, and discussed and fussed and changed some more.

We wrote a loose "breadth requirement" into the set of guidelines we gave to the seniors. We wanted multidisciplinary approaches and wanted to encourage students to explore their topics through more than one lens. In practice, the requirement tended to lapse. We continued, however, in our coaching interactions with students to push for personal and social, as well as technical, explorations of the topic. We now believe a breadth requirement would be useful. We were disappointed with some of the projects when a rich search for resources and a wide understanding on the part of the students had as its product a useful pamphlet that reflected little of that richer understanding. We want to rework our requirement for next year, perhaps to ask for more than one type of product in this type of situation. We will use some of this year's projects that do show breadth as examples.

Three requirements that we *did* use were very productive. One was that students had to produce a real product that was of actual use to someone else. Their products could be health education pamphlets to be used in our soon to be school-based-clinic's-Health Education Center, pamphlets on possible careers for future Health Academy students, community service projects, and so on. With limited time, however, only some of the final products actually met this standard, but the topics chosen and avenues pursued did reflect this requirement, and it did push students to think about planning, financial resources, and their audience in a more serious way. The requirement also encouraged student contact with people in the field. With more time, most of the projects could genuinely meet professional standards. The "real products" requirement was the richest in guiding students to pick good topics; it also produced some unintended results, allowing the production of narrowly technical final products without much breadth.

A second requirement that students do research using community resources; interviewing professionals and patients; and/or visiting offices, clinics, or advocacy programs was adhered to by every group. Almost every group included material on occupational structure and organization in their projects. The focus of others was shifted from "What are the treatments for this disease?" to "What services are provided to patients with this disease?"—a move away from a simply technical understanding toward one that reflects knowledge of AAI.

Lastly, students were given a series of reflective writing prompts, some required and some chosen, which asked them to think about their process and progress through the project; in the final presentation, students were required to evaluate their projects. Some of the prompts were directed toward one or more of the AAI aspects; the whole process of self-evaluation led to many interesting reflections on the students' own planning, on the nature of the industry with respect to their topic, on the industry resources available to them in their project, and on their learning process and progression.

Examples of AAI Themes in Senior Projects

Many of the projects and products our students produced, even in a limited run of the major Senior Project concept, justified our belief that projects can be used to both encourage learning about AAI and to demonstrate it. (Seniors have completed Senior

Projects in the past; these were, however, simpler in design and often lasted six weeks to two months). Topics fell in several broad groups:

- Particular diseases—usually ones with which students had family or personal experience (5 projects, 5 students)
- Career explorations (3 projects, 7 students)
- Health education outreach projects (5 projects, 12 students)
- Community issues projects (7 projects, 18 students)

Next year we will use the best projects as examples and give students and ourselves more time. We will build on this year's successes and continue to work with students to create even more powerful projects and products that can and will be used in community and professional settings or beyond the classroom setting. We also need to seek additional funding to help students with Senior Project expenses, since most of our students are low income families, and senior year at any high school entails many added costs. A local chapter of American Association of University Women recently granted the Academy $1,000 to use as a Senior Project fund in 1994-1995. Students will be able to apply for mini grants for supplies and services needed to implement their projects—such as film, art supplies, copy services, and film development. We plan to seek additional funding from other sources in future years.

Space will not permit simply reproducing the better projects (though we think this is most convincing to teachers), so we will summarize some of them. Remember that these students had neither an explicit AAI requirement, nor much specific experience with AAI. Nevertheless, many AAI themes do come up in their projects. We hope that reading these will help you see the synergy we have been arguing exists between AAI and projects. Students who are encouraged to investigate topics they are interested in and who are given appropriate prior experiences and models, will see for themselves the importance of some of these aspects. As a result, their understanding of those aspects will be much richer than if they had learned about them through a lecture, film, or reading.

- *Diabetes*
  This student had a family member with diabetes and wanted more knowledge about its effects and treatment. She talked with a nurse-practitioner specializing in diabetes treatment and produced an introductory pamphlet. In her presentation, she used patient stories from a commercial videotape to illustrate the differences between the two major types of diabetes.

- *Labor and Delivery Nurse*
  This student was doing a senior internship at Alameda County Medical Center—part of it in Labor and Delivery. She produced an occupational profile pamphlet, which included information on duties, education, the differences between the job and other jobs in the department, and personal comments.

- *A Guide to the Emergency Room*
  This group of three students were interested in seeing an ER close up and used the project as a way to do it. They visited two area ERs; interviewed a triage nurse, a staff nurse, and a doctor; took pictures; read ER procedure manuals; and produced a "Patient Guide to the Emergency Room," discussing ER procedures, what to take, what not to go to the ER for, and so on.

- *Oriental Medicine*
  This group of three students were intrigued by acupuncture and Oriental models of medicine, and felt that few people outside the Asian community knew about Asian medical models. They investigated the philosophy of Oriental medicine and how it differs from the western philosophy of medicine and the specifics of both acupuncture and herbal treatments. They visited an acupuncture clinic and an Oriental herbs store, attended a workshop on Oriental medicine sponsored by the local botanical garden, and went on a tour of the medicinal herbs collection that was sponsored by the University of California at Berkeley's Botanical Gardens.

- *Intergenerational Learning*
  These students were interested in increasing the contact made between elementary school children and older generations. At first, they tried to arrange to coordinate a contact activity between a senior center and an elementary school. The senior center backed out partway through, but the students regrouped and organized an afternoon where Oakland Tech students (more than themselves) came to the

elementary schools and led activity workshops for third graders about self-confidence, stereotypes, and violence. This group's planning process and organization were impressive; the members steered their way through institutional lethargy, lack of time, and the permission slips and related paperwork to deliver a well-organized and successful product.

- *Exercise Program for Learning-Disabled Students*
  These students did Senior Projects this spring in which they helped develop a sports program for several students in the program at our site for severely learning-disabled students. They found ways to use sports to work on basic social skills. They also talked to a geneticist about the disorders these students had and developed a computer program in IBM Linkway describing (with pictures) what they did and what they learned.

- *Using Bilingual College Students as Translation Aides*
  This group of students had considerable experience functioning as translators for medical care situations for their extended families and saw this as a skill they had that would be useful to the hospital. They decided to develop a proposal for employing bilingual college students as translation aides for noncritical interactions. They interviewed the director of translation services and several translators at Alameda County Medical Center and developed proposals for eligibility, testing, training, and placement in the hospital, as well as a proposed budget.

Postsecondary Articulation: Implementing AAI in a Community College-Based Radiologic Technology Program

Overview

Merritt College in Oakland, California, is a community college within the Peralta Community College District. Its Program of Radiologic Technology is a 24-month program designed to prepare students for careers in diagnostic medical imaging, particularly x-ray technology. The program provides concurrent classroom study at Merritt College and clinical education at various East Bay hospitals that leads to the Associate of Science (AS) degree in Radiologic Technology. The program is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT), a branch of the Committee on Allied Health Education and Accreditation (CAHEA).

Students successfully completing the requirements of the Merritt College Program of Radiologic Technology are eligible to take the national examination by the American Registry of Radiologic Technologists (ARRT) and the certification examination for radiologic technologists (CRT), which are administered by the State of California, Department of Health Services Radiologic Health Branch. Passing these examinations permits technologists to perform diagnostic radiologic examinations in a wide variety of clinical settings. Radiologic technologists perform duties in the operating rooms, emergency rooms, in acute care nursing units, and in medical imaging departments of hospitals, as well as at outpatient clinics and physicians' offices.

As an instructor in the Merritt College Program of Radiologic Technology, I teach a variety of classroom subjects, including Radiation Biology and Applied Radiographic Physics. I am also responsible for the clinical instruction and evaluation of approximately 32 second-year students in their assigned hospital training sites throughout the East Bay area.

When I began teaching at Merritt College two-and-one-half years ago, I was also assigned the responsibility of developing and coordinating a Tech Prep program with the Oakland Technical High School Health and Bioscience Academy. At this point in time we are close to completing an articulation agreement between the Program of Radiologic Technology and the Health Academy. This agreement will allow Health Academy students to complete prerequisites for the program (Anatomy and Physiology, English Composition, Elementary Algebra, and an introductory course in radiologic technology) during their junior and senior years in high school. In addition, they will have the opportunity to receive competitive program selection points for completing internships in diagnostic medical imaging departments in partner industry hospitals such as Highland Hospital and Kaiser Permanente in Oakland. This agreement will greatly shorten the time it normally takes students to be prepared for entry into the Radiologic Technology program. Work is currently in progress for similar agreements between the Health Academy and other Allied Health programs at Merritt College. Vista Community College in Berkeley (another college within the Peralta Community College District) has been working toward a Tech Prep program between Oakland Tech's Bioscience Academy and Vista's Biotechnology Technician degree and certificate programs.

Oakland public schools have traditionally been plagued with high dropout rates, with few graduates going on to two- or four-year colleges or to occupational training programs. The city of Oakland also has extremely high unemployment rates. Tech Prep partnerships, when fully in place, will hopefully provide students with knowledge of career options and pathways to facilitate attainment of their goals. An important role of Tech Prep is to provide high school students with a "foot in the door" to the community college before they leave high school. By allowing students to take community college courses on the college campuses during their senior year of high school, we hope to help them become accustomed to a college environment and be less intimidated by it. Many of Oakland's high school students will be the first in their families to continue their education past high school, and we firmly believe that if students can begin making that transition before they "fall through the cracks," we may hook them and assist them in their progress of pursuing productive career goals.

The AAI Project

Becoming a Tech Prep partner with Oakland Technical High School Health and Bioscience Academy has allowed me to work closely with Patricia Clark and some of the other faculty members at the high school over the past two years. As a result, I was invited to participate in the Joyce Foundation All Aspects of the Industry Partnership.

My first glance at the AAI framework left me with doubt and confusion as to how on earth it could be applied to the health care industry, and in particular to an accreditation-driven curriculum such as a Radiologic Technology program. With the exploration and guidance provided at the Cambridge and Berkeley workshops, along with the support of the sponsoring institutions during the course of the project, I was able to better understand and begin to implement the framework on a small scale in several of the courses and clinical rotations that I teach. Through working with the team participants from Oakland Tech, we were all able to assist each other in our understanding of the project and its implications for us individually and as a whole.

Barriers To Implementing AAI in Rad Tech Programs

At first, all of us tended to focus on perceived barriers, of which there are many! The following were comments I made or heard my colleagues make in response to AAI:

> We barely have time to teach the *essentials* in a two-year period as it is!!! Add MORE to current curriculum???
>
> We don't know very much about those "other aspects" outside our realm ourselves!!! How can we teach about them competently to our students???
>
> It seems so forced to try to cram each of the "all aspects" into each course!!!
>
> Everyone in those other departments at the hospitals are so territorial!!! They guard their areas of expertise like mother hens!!! They're unwilling to share their knowledge and skills because they think we want their jobs!!!
>
> We have too much to do as it is!!!

"All Aspects of Radiologic Technology": Applying the Model to Radiologic Technology Programs

After calmly examining the AAI model and exploring its meaning for the health care industry with my team, I was able to identify some specific applications for the "sub-industry" of medical imaging:

Planning

- Personnel scheduling according to patient load at various times of the day (based on previous statistics)
- Patient scheduling of exams based on interacting effects of medications/contrast media/radio pharmaceuticals "on board"
- Purchasing of capital equipment based on present and future demands
- Purchasing/ordering of department supplies based on previously documented patterns of use
- Hiring of personnel in specific areas based on present and future needs and technological advances

Management

- Cross-training technologists in different specialty areas to fill present and future demands ("the Multiskilled Worker")
- Worker involvement in decisions are possible to a certain extent but difficult because of the hierarchical nature of the health care industry
- Scheduling, supervising, and evaluating of employees

Finance

- Justifying of expenditures based on patient load/population and technological standards
- Financing of capital equipment, supplies, personnel, training, and continuing education for technologists in a constantly evolving field

Underlying Principles of Technology

- Equipment operation and maintenance
- Radiation Physics and Biology
- Radiographic Positioning, other "core" courses

Labor Issues

- Advantages and disadvantages of union vs. non-union radiology departments

Community Issues

- Health care reform
- Access to health care
- Community problems such as teen pregnancy, substance addicted newborns, substance addicted adults and children, violence, and joblessness and how they all affect health care, its quality, and its availability in a community

- Social and economic principles at work that greatly affect the health care delivery system and underlie technology

Health, Safety, and Environmental Issues

- Body substance precautions
- Hazardous materials safety training
- Proper body mechanics when moving patients
- Radiation safety for workers and patients
- Hospital emergency; disaster plans

Aspects We Need To Add

- Ethics
- Medicolegal issues

After examining these aspects in light of our current curriculum, I realized that we were doing an excellent job of covering many of the aspects. Underlying Principles of Technology; Labor Issues; Health, Safety, and Environmental Issues; and Medicolegal Issues are our strongest areas. We address Planning and Community Issues on a more limited basis, and we barely address Management and Finance at this time.

Through working with the project to understand and implement AAI, I was able to come up with some solutions for implementation that were fairly simple and could be accomplished with a minimum of disruption in the structure of our program.

Solutions To Implementing AAI in Radiological Technology Programs

- It is actually easier than it initially appears to infuse AAI into the existing structure without completely disrupting our curriculum. We are already doing an excellent job of including MANY of the aspects now. In addition, exploring some of the more difficult aspects in the form of student projects is one of the easiest and least painful ways of complying with the Perkins Act mandate.

- The fact that we are not experts ourselves at AAI can also be solved by having the students explore the program through projects and share their information with the class. They are a tremendous link to industry, providing up-to-the minute information in technological advances.

- Time is on our side! We have two years to include AAI, and some courses naturally lend themselves to some aspects, others to different aspects. As long as our students are gaining understanding and experience in AAI by program completion, we are in compliance.

- Start SMALL!!! Begin with projects on a small scale and build. Small projects, each addressing only one or two aspects at a time, may be more effective than trying to cover AAI in a single larger project.

- The health care industry is evolving into a broader-based, multiskilled worker model. As this happens, programs that have a strong AAI base will naturally progress along with the industry (with some guidance and structure on the part of the educators).

As I began working with student projects dealing with AAI exploration, I began to see some expected benefits to myself and my students, as well as unexpected surprises, which helped me see how AAI provides relevance and enrichment to our present curriculum. Something that I was most struck by was the students' fascination with aspects not previously addressed in their program. In particular, examining financial issues and access to health care provided the springboard for many animated discussions. These issues impact the students directly both from a personal and a professional standpoint.

Benefits of Implementing AAI

- Students who understand the "whole picture" and their role in it are more efficient, understand patient and work flow, and make better health care team members.

- As educators, we can learn as much from our students and other health care workers as they can learn from us.

- Our students have clearer career paths and are open to a greater number of possibilities.

- Our students are more flexible, adaptable, and multiskilled, which are essential characteristics for an effective workforce of the future.

Ideas for Projects Addressing the Aspects Not Well-Addressed in Our Present Curriculum

- Have students research and develop a Medical Imaging department budget.

- Take one topic relating to Medical Imaging and explore AAI by using the AAI "web."

- Have students develop and produce a product that can be used by the hospital, department, or patient (e.g., translate information brochures into another language, and so on).

- Project for cost savings within a Medical Imaging department.

(Please see "Postsecondary Articulation" in the Oakland Health and Bioscience Academy section of the Supporting Materials for (1) example of an AAI Exploration Project used in a Radiologic Technology course; (2) other possible ideas for AAI projects; and (3) Radiology Apprenticeship Log Book.)

Conclusions about the Importance of AAI

Reading our own case study and reflecting on what we and our students learned about and did with AAI this year, we feel a strong sense of accomplishment—that we have demonstrated the fertility of AAI themes in a school-to-career program. It did not always feel like this at the time, however. As always, there was too much to do, conflicting demands, scheduling disasters, subdisasters, student crises, and staff conflicts. Our work with AAI is partial, unconsolidated, unfinished—and we will do certain things differently next year. But in each of the areas where we tried to use AAI themes, we made significant progress; AAI themes are an essential tool. In this final section, we want to discuss what we still have to do, and then outline what we believe are the strongest reasons why AAI is something all school-to-career programs *need* to use if we are to fulfill our mission.

The topics we have included in our case study are not the only possible applications for AAI we see in the academy. We still need to look at existing course outlines and interdisciplinary projects and figure out where there is already AAI material that might be explored more explicitly and where other AAI concepts and applications might be added. We need to design more projects that focus on one or more aspects of the health care and bioscience industries. We plan to use the school-based clinic and Health Education Center as working laboratories for applying AAI knowledge. We are working with both health care employers and postsecondary partners to create better articulation and quality youth apprenticeships that will demand a whole new level of mastery regarding the industry during the academy senior year.

Teachers and students will create, over some years, more projects, small and large, that tie our classes to industry and to one another. All of these will involve, among other things, applying the AAI themes. Events in the world and in our community, as well as student curiosity, interest, and enthusiasm, will sometimes lead us to focus on some particular AAI aspects more than others. We will grow to a deeper understanding of how AAI is actually a form of systems thinking and of how the various aspects interplay. We will learn to integrate the AAI aspects rather than simply explore or apply them as if they were somehow separate. In the best T. S. Eliot sense, we "shall not cease from our explorations" until we experience a fundamental shift in what we know and in our ways of knowing. It will be some years before AAI becomes as natural to us as breathing, and even then the AAI lens will be one that lives, shifts, changes, and supports the learning we do with students and the new directions this takes.

There are aspects of our industry that will require us to develop brand new curriculum and projects rather than fine tune what we have. The economics of health care needs far greater student investigation as do the politics of health care. In 1994-1995, our senior English and Government/Economics classes will be team taught and block scheduled as a senior institute which will support major student projects and encourage community involvement/development. The fact that there is always more to do underscores for us one of the most important points about AAI: AAI is not a one-time fix, but a set of ideas that can help guide the program/school/worksite/community/system over time.

AAI and Student Outcomes

If we want our students to succeed in the world of work and in their lives, we need to find ways to give students a real understanding of the facets of AAI. If we narrow our goals to particular occupations or to job readiness skills, we do our students a real disservice. Students who cannot upgrade their skills over time, who understand only one occupation, and who fail to see how their job fits into the industry's larger picture are not going to go on to successful careers in health care at any level. When our students go out to their internships and we talk with their supervisors and coworkers, we often hear comments on how well-prepared academy students are, how well they understand what each department does, and how well they can relate what they are learning and doing in their internship into the total health care context. Health employers want employees with multiple skills and an understanding of the entire industry; the fact that our students learn about the industry as a whole makes employers more interested in working with us and in hiring our students.

At one point in our discussions of AAI this year, we made a list of student outcomes—what we want our students to know and be able to do by the time they graduate from the academy. Our goals may be a little lofty, but they give a sense of our vision and why AAI is a necessary tool in reaching our goals:

- We want students to graduate with health and bioscience career paths in mind and with clear ideas of the health care and life science environments that appeal to them. We want them to be able to spend time in a department or lab and to "size it up" correctly; to identify the formal and informal chains of command, the skills and the technology involved, and the personal attributes required; to know how they might fit in; and to know whether this is a place they might want to work. We want them to have realistic expectations about how to proceed through the multiple paths through school and work toward their future; we want them to realize that all these paths require hard work, planning, and sacrifice, and that all contain challenges, risks, opportunities for learning, and the potential for successes and joy.

- We want our students to graduate with the knowledge and skills necessary for postsecondary education. Young people must know how to learn and develop a passion for and a commitment to lifelong learning in order to succeed. For all our students who continue in health careers, the next years of their lives especially will involve additional education and training, whether at four-year colleges, community colleges, professional/technical schools, or on the job.

- We want our students to have both health care job skills sufficient to support themselves—whether they work full-time right away or work their ways through college—and the transferable job skills necessary to be a flexible part of a rapidly changing and highly technological society.

- We want our students to have entrepreneurial skills so that they can create community health positions for themselves and can understand and act upon emerging health career opportunities.

- We want our students to be active citizens, to know how to carry out a project in their own community, to be the formal or informal health care experts and advocates for their families and their communities, and to participate in the health care debates.

We believe these are realistic goals. They are necessary if many of our students are to go on to successful careers in health care. The broader perspectives of AAI in regard to both the industry and work can help to design the workplace experiences, project experiences, and curricular integration that these outcomes require.

AAI and Program Coherence

Related to the development of the kinds of rich experiences for students that the outcomes above require, we think that AAI has a central role in maintaining and developing coherence in our program. *If you want to build a program which is both complex and coherent, you need a vision that includes key concepts—understood by the staff and students—that can inform the many projects, classes, and experiences and opportunities that make up the program.* Some years there are new academy teachers and/or course offerings. There are always new employers, departments, or postsecondary schools that are interested in working with us; new instructional supplies or equipment, new insights; new directors; and new funding opportunities which change the way we work together as a learning community. No one person can oversee everything. Without some guiding principles, this constant change easily becomes incoherent. Attempts to impose coherence are made by having an expert team develop a program design which specifies the place of each course and learning experience ultimately fail for similar reasons: The year-to-year process of change erodes the edifice, and the new does not fit with the old. Only if the staff as a whole understand some guiding ideas and apply them in areas and efforts that each of us take on in a year can the many components that make up a powerful learning community become a coherent whole.

AAI is one of those key concepts or ways of thinking that can give a program coherence. AAI is a framework for seeing the industry as a whole; for seeing interrelationships, patterns, and interconnectiveness between school and work, academic and technical, and different disciplines and different ways of constructing knowledge. AAI can help make workplaces into learning places; help infuse the knowledge and experience of industry into classrooms; help in designing student project benchmarks; help in connecting school and work to community; and help students to be successful interns, critical thinkers, reflective practitioners, and lifelong learners.

We urge you to find successful ways to use AAI.

Oakland Health and Bioscience Academy Student Progression

1st Year: (students enter as ninth or tenth graders): Academy Biology; Academy Biology Lab (includes First Aid, CPR, hands-on medical techniques, beginning biotechnology, bioethics, all aspects of the health industry projects, and so on); Academy Computer Lab (word-processing, database, spreadsheets, multimedia computer applications, telecommunications, and so on); Academy English (with an emphasis on health and bioscience literature); Academy World Cultures (with an emphasis on world health history and issues); Academy Math (levels vary); volunteer experience in local hospitals, clinics, and community health organizations; career mentors; service learning and community development projects; career portfolios; public health projects; the Health Academy Puppet Theater Project; and so on

2nd Year: Academy Physiology; Academy Physiology Lab (includes health education projects, clinical and hospital administration rotations, and so on); Academy English (with an emphasis on writing about health and bioscience issues); Academy United States History (including history of health care in America, labor history, career projects, and so on); Academy Math (levels vary); Career Explorations, field experiences, and paid summer internships/youth apprenticeships; Career and Work-Based Learning Portfolios; and Career Technical Projects

Summer After Junior Year: Summer Internships/Youth Apprenticeship Placements; Summer Enrichment Program (includes reflective learning; projects which connect school, work, and community; seminars; journals; career speakers; worksite mentors; and so on)

3rd year and/or 4th year: Academy Chemistry; Academy Advanced Biology; Academy Advanced Health Occupations (ROP) (includes 200-hour clinical placements, certification, problem-based learning, medical terminology, career technical portfolios, and so on); Academy Advanced Health; Academy English; Academy Government/Economics (English IV and Government/Economics are block scheduled as a Senior Institute); Academy Math (levels vary); concurrent postsecondary enrollment through our 2 + 2 Tech Prep partnership with Peralta Colleges (college-level courses are offered for academy students both at our home school site and at the apprenticeships; Senior Projects; Senior Seminars; Community-Based Projects, Senior Exhibitions, and Demonstrations of Mastery; and help with college/job/scholarship applications

Summer After Senior Year: Internships/Youth Apprenticeships continue; Summer Enrichment Program continues (reflective learning, journals, projects, and so on); concurrent college classes; and help with job placements

Note: Individual student programs vary depending on interest, achievement, and willingness to accept challenges. Foreign language, fine arts, and other elective courses are taken in the general program at Oakland Technical High School.

Our 2+2+2 Tech Prep Program supports natural career pathways for all students. Interested academy students continue in a combined youth apprenticeship/community college program which builds on their high school experiences and results in real certification in technical and/or allied health. Additionally, many academy students elect to continue their studies in four-year colleges/universities and professional graduate programs.

The following are also included in the academy program:

- First-hand exposure to career concepts and applications through field trips; guest speakers; and individual field experiences in hospitals, clinics, postsecondary science facilities, and health/science-related industries
- Hands-on, discovery, problem solving, project approach to biological sciences with almost daily experiments and explorations
- Opportunities for learning experiences and progression from novice to mastery at the worksite, including paid summer and senior-year internships/apprenticeships
- Adult career mentors and postsecondary student coaches
- Frequent contact between school and home, and activities which involve parents and families
- Tutoring and workshop support services (peer tutoring, Enrichment Clinic, college tutors, adult volunteer tutors, homework hotline, and so on)
- special health science and medical laboratory technique training, including Multimedia First Aid, CPR, medical terminology, AIDS education, clinical lab skills, and so on
- Development of an individual C-TAP that showcases each student's competencies, strengths, and achievements
- Student Peer Educator Projects and student-produced health education materials connected with our student-run Health Education and Resource Center
- Assistance with résumés, college and job applications, SAT/ACT preparation, interview techniques, study skills, and strategies for success
- Special social and award activities for academy students and families

- The close sense of community which results from being in the Oakland Health and Bioscience Academy

Past and present Academy students love and value their academy experience. In the words of academy students, "We are family."

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THE RINDGE SCHOOL OF TECHNICAL ARTS

Abstract

The Rindge School of Technical Arts provides a very different context for an AAI development project. Since 1991 (two years before a team of teachers started working on this project), Rindge had been pursuing a course of reforms that explicitly sought to provide students with strong experience in and understanding of all aspects of the industry. Much of the four-year program had already been reshaped, with AAI implementation as a goal. This basis allowed the team to zero in on the weakest link of the program—the tenth grade.

When visiting Rindge in the Fall of 1995, there was a set of three tenth-grade courses in place. Pathways, the cornerstone of the sophomore program, integrates job shadowing, research projects, and student development of mini-enterprises. U.S. History/Humanities draws on the history of technology, industry, and labor as recurring themes. The third course, Introduction to Technology, is a brand-new physics and engineering course. Tenth-grade students at Rindge generally take all three courses (as well as taking mathematics and additional courses in other parts of the high school). AAI runs throughout, with a particular focus in Pathways, as part of job shadowing, entrepreneurial, and job researching activities.

After observing the program, and feeling the sense of satisfaction that it is on the right track, it is almost hard to recall the struggles to get here. Like most organic processes, the development process at Rindge was not always straightforward. Many of the ideas generated for the tenth grade were ultimately abandoned. Many others were transformed into new and unforeseen uses. One program developed for the tenth grade proved unworkable in that context, but matured into an upper-grades school-based enterprise. By 1995, the tenth grade had evolved into a new program that no one could have predicted, but that everyone agrees fits the bill. Because each iteration built upon the one before, and because teachers in other schools might find some of the earlier programs interesting for their own schools, this chapter describes the progression, as well as the end result.

OUR SCHOOL: THE RINDGE SCHOOL OF TECHNICAL ARTS[1]

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The Rindge School of Technical Arts (hereafter referred to as Rindge) is one of six "houses" at Cambridge Rindge and Latin High School. The high school as a whole has a student population of approximately 2,200 and more than 46 different languages are spoken. Rindge serves a student population predominantly comprised of students from low-income families, as well as a high immigrant population. Each of the high school's six houses has its own identity. Over the past few years, Rindge's identity has changed radically, from the vocational component of the comprehensive high school to a house that offers an integrated vocational and academic program.

Previously, Rindge was a typical vocational school. In the ninth grade, students rotated through different shops; then in the tenth grade they began vocational majors such as carpentry, electrical, automotive, and culinary. All of the academics were taught outside of Rindge, in other houses of the high school. (Years ago, the academics had been taught within Rindge. They were removed, largely as a budget-cutting tactic, but also in part due to criticism of the low academic quality.)

Beginning in 1991, the Rindge staff began forging new directions for vocational-technical education. Turning away from practices that, in effect, forced students to choose between college preparation and vocational skills, Rindge reshaped its program to prepare students for both work and further education. Preparing students for work includes, but goes beyond, preparing them to get jobs or even to have careers. The reform at Rindge sought to better enable students to take part in the life of their community—economic, political, and social—and to positively affect it.

Towards this end, changes at Rindge focused—and still focus—on three primary program goals:

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[1] A note on language: As teachers have worked to integrate vocational and academic learning at Rindge, both their roles and the content of the courses they teach increasingly defy categorization. However, city and state course credit systems still demand categories. In this chapter, the "vocational" and "academic" course labels signify credits, but they do not necessarily represent the entire content or goals. When applied to teachers, "vocational" and "academic" labels refer to training and previous experience. They are used in this chapter, not because they define who people are or what they do, but because it is interesting to know how people's backgrounds lend themselves to new opportunities.

1. Integrating vocational and academic education
2. Redesigning vocational education from occupationally specific, narrow skill-based training to "AAI" instruction
3. Forging links between vocational education and community economic development efforts

To facilitate integration, vocational and academic staff began meeting daily to plan instruction. In order to create common time for planning and teaching together, the vocational shops were scheduled only for the afternoon so that all of the shop teachers were available for morning meetings and team-taught courses.

The first step in the overall reform of Rindge was that of completely redoing the ninth grade for 1991-1992. All Rindge freshmen were to take CityWorks, in which they worked on a variety of projects which related to the city of Cambridge and learned a combination of technical, academic, communications, and teamwork skills. Most of the projects were hands-on but also utilized academic skills such as writing, mathematics, research, and presentation.

Many of the CityWorks projects took students outside of the school to explore and analyze the city. One of the first experiences of a CityWorks student was the Walk Around the Block exercise in the fall. Students ventured forth in small groups, accompanied by a teacher, to investigate a small area near the school. They interviewed pedestrians (using survey questions they had prepared beforehand), took pictures, made measurements, and drew maps. Returning to the school, they created a presentation board showing the block.

In the course of the year, CityWorks projects introduced students to a variety of industries and taught an array of technical skills. Instead of doing so within a rotation-type exploratory, students learned within the context of exploring the city in which they lived and in doing real work that contributed to city improvement initiatives. For instance, the city of Cambridge was planning to build a heritage museum. Responding to a request from the city's tourist agency, teams of CityWorks students drew up designs for the museum. The students then exhibited their drawings and scale models and presented their plans, complete with location proposals and rationale, to parents, city officials, and local business people. In the process, students gained model-building and other technical skills, developed their communication abilities, and learned about the tourism industry (a major industry in Cambridge). Other students designed tours and wrote brochures for visitors. One featured places of interest to teens, another the best desserts in town, and another the efforts of a local hero. Students designed Cambridge t-shirts that the board of the city's tourist agency then adopted for sale and distribution. Other projects taught students electrical, carpentry, and additional technical skills.

As part of the overall reforms at Rindge, academics were brought back in-house, beginning with the ninth-grade program and the upper-grades internships (which gave both vocational and academic credit), and in 1993-1994, into the tenth-grade program. This made it possible to go much further in integrating vocational and academic learning. (In the future, more in-house academic classes may also be offered. A staff shortage—or rather, a lack of funding to pay staff—stands as the biggest hurdle to developing more integrated courses. As we discuss later in this chapter, there are also concerns about segregating Rindge students from the rest of the high school students if all of the former's academic classes are in-house.)

The ninth-grade academic components use the same theme of human and city development as the context for learning. The academic courses draw on the same hands-on skills being nurtured in CityWorks, blurring the line between vocational and academic courses. For instance, students in CitySystems, as a way to study life sciences and geometry (which gives mathematics and science credit), make models, using a variety of materials, of buildings and of human systems.

Although Rindge is not a member of the Coalition of Essential Schools (which is discussed later in this book), they closely follow the Coalition approach of "less is more," placing priority on helping students to learn to use their minds well by engaging them in a few, important ideas. To stimulate these "habits of mind," and to deepen the connections across vocational and academic courses, certain approaches and themes are used across courses—in addition to the theme of human and city development. The ninth-grade teachers have agreed that they want students to learn (and begin to apply) several key "ways of knowing" or approaches to continued learning and doing. For example, similar to the coalition's focus on Essential Questions, they want to help students learn to use a scientific method of problem posing and problem solving in all of their classes. In a variety of contexts, students are given problems and must ask themselves the following questions:

"What's the problem?"

"Why does it matter? Who cares?"

"How does it connect to other things I know?"

"How can I find out more about it? (Who can tell me? What can I read?)"

"How do I know who or what to believe?"

"What do I think is true about this problem?"

"Can I prove it?"

"What do I now know that I didn't before?"

"How can I teach others what I know or convince others I'm right?"

The junior and senior years at Rindge are now structured around four career paths: (1) Health and Human Services, (2) Arts and Communication, (3) Business and Entrepreneurship, and (4) Industrial Technologies and Engineering. Each path combines school-based learning with work-based learning. The career paths offer students opportunities to participate in school-based enterprises and to enter internships through which they can reinforce and extend their classroom learning and contribute to the revitalization of their community.

The school-based enterprises, such as the Cantabrigia restaurant, are particularly important as a setting for students to see how all the functions of a business fit together and to gain actual experience in all aspects of that industry. The internships utilize other strategies to help students build on their direct experiences. Students interning at Polaroid Corporation's research facility, Harvard University's Facilities Department, and local, public elementary schools participate in daily seminars that foster analysis of their experience and of the work setting through journal writing, complementary readings, and related projects. For example, students in the Careers in Education Program (part of the

Health and Human Services career path) write every day in site logs at their internship sites. The seminar then builds other writing assignments on those entries; students write site log analyses, reflective pieces, and by the end of the year, autobiographies.

The Tenth-Grade Dilemma

Back in 1991, the plan for change at Rindge was to rely primarily on a "pioneer cohort model" of change, in which each grade is redesigned as a certain cohort of students progress. Although this was never expected to be the sole process for change (some changes in the junior and senior experiences were implemented right from the start), it was the schedule for the largest scale reforms. As it turned out, the process has been even more irregular than expected.

The tenth grade, in particular, has been a challenge. We wanted students to gain exposure to the various career paths so that they could make informed choices about their junior- and senior-year activities. We also wanted them to gain transferable academic and work skills that they could build on regardless of what they studied later.

It seemed appropriate, given these goals, to use an AAI focus as the overall theme for the tenth grade. It could serve as the underpinnings for integrating the tenth-grade vocational and academic courses. In studying all aspects of various industries, students would gain a basic understanding of the industries encompassed in the upper-grade career paths. Knowledge and skills in planning, finance, management, principles of technology, labor, community, health, safety, and environment—all but technical skills—would in large part be transferable across industries, and even into other fields of study.

We did not, and do not, see AAI as being taught solely in the tenth grade. The overall school plan is based on scaffolding—constantly building on previously taught skills. In ninth grade, students learn planning and other skills in a cross-industry context by studying the community. In a sense, they are learning generic planning skills, management tactics, and so on. Planning and community issues, in particular, are at the core of the CityWorks curriculum. In their junior and senior years, students learn all aspects of particular industries, going into more depth and gaining real experience in how different aspects play out in the real world. We wanted the tenth grade to bridge the ninth and eleventh grades, introducing a stronger industry context for student learning.

The Recent History of the Tenth Grade: The 1992-1993 Electric Vehicle Project

When we began this project, the tenth grade had already gone through various incarnations. The first year of CityWorks (1991-1992), a year of major change, had brought the Rindge staff an entirely new way of doing things and a sense of momentum which propelled the new tenth-grade reform. Beginning in the spring of 1992, many of the daily meetings focused on the tenth grade. Teachers had been searching for a segue from ninth to tenth grade. Traditionally, Rindge sophomores had made a career choice at the end of the freshman year and would now be in their "major"; we realized this was a lot to ask of a fifteen-year-old. In the new system, freshmen in CityWorks looked at the community as it was, and in the sophomore year, teachers wanted students to look at the community as it could be.

A group of staff met daily in department cluster teams, including Transportation (comprising automotive and metals); Communications (with computers and graphics); Construction (with contracting, carpentry, electrical, and drafting); and Culinary (which was in a category by itself). The intent was to design a project for each cluster which would involve team teaching through a multidisciplinary approach and which would incorporate AAI. One difficulty was that the only academic instructor available for the daily meetings that year was a freshman humanities instructor who volunteered to meet with all the clusters on a rotating basis and would provide technical assistance in the humanities area. (It wasn't until 1993-1994 that Rindge was able to offer any tenth-grade academic courses in-house.)

To jump-start the process, teachers tried to generate ideas, asking a few basic questions such as description of project, length of time, areas involved, advantages, and possible drawbacks. Basic project guidelines were established. Projects needed to be useful, fulfill a real community need, and hold the interest of staff and students. In the transportation cluster, the idea of an electric vehicle, as in a small go-cart or utility type cart, evolved. At that time, if any one had mentioned high school kids building a full-sized electric passenger vehicle, they would have been laughed at.

Other clusters tossed around various ideas and decided to join in on the Electric Vehicle Project. This helped push the thinking and started discussions about how to build a full-sized electric vehicle. Keeping within the basic project guidelines, we decided to build a practical vehicle that would demonstrate the usefulness of electric vehicles. After researching the feasibility of this idea, students determined that converting a gasoline powered vehicle instead of building one from the ground up was our best option.

The further they researched, the more interesting the project became. Apparently, a whole subculture of electric vehicle enthusiasts surfaced during the Carter administration when research on alternative means of transportation was fueled by rising oil prices, dependence on foreign oil, oil embargoes, and Americans' distaste for the Iran hostage situation. This subculture was designing and building electric vehicles in the hopes of a new emerging industry. When Reagan took office, the survivors of this subculture moved underground, actually into their basements and home garages. What all this meant to Rindge was that there was a substantial group of people with a wealth of information ready to share. This is when the project truly became a reality.

The plan for 1992-1993 was to create an electric vehicle industry within Rindge. Each technical area would be contributing throughout the year. Staff brainstormed about different ways that technical areas could be involved and came up with a truly beautiful time line which clearly defined the who, what, and when.

- The Communication Group would handle spreadsheets for labor costs, material costs, fuel efficiency, inventory databases, and payroll; technical writing; market research; public relations; t-shirt logos; business cards; owner's manuals; a paint scheme; and documentation of the project.
- The Construction Group would handle the wiring of the vehicle, charging station, blueprints, technical manual, and trailer.
- The Transportation Group would be responsible for design, chassis construction, drive train, suspension, and body construction.
- The Culinary Group would run a cafeteria for the workers.

The plan was for students to rotate—one quarter in each technical area. Each quarter all of the technical areas would spend two weeks with each aspect from the AAI list, demonstrating its impact on one out of four areas: personal, technical area, enterprise, and an industry. Students would not be forced to rotate, but it was generally expected that they would change technical areas at the end of each quarter.

September 1992 rolled around and it was time to implement. Students began with a process by which they had to apply to each technical area. Each student had to interview with the teacher and show his or her portfolio from CityWorks. Students were encouraged to look at the skills they had acquired both in school and out and were asked to describe how they could contribute to the team's work in that area. The hope in doing this was to garner student investment by giving them responsibility and drawing off of their skills and interests. It also provided a direct link with their experience in the freshman CityWorks program by providing them the opportunity to apply what they had learned in this new situation.

From there, the teachers wanted students to experience the need for electric vehicles. To start, they had students do a quick and dirty research project that focused on three skills: (1) library, (2) observation, and (3) interviewing. All of the students researched environmental disasters related to the technical areas they were in at that time. From that research, they had to demonstrate how technology had been used to correct the problem and what changes in technology had come from the disaster. Teachers knew students' interest in mayhem would hold their interest for this project. They wanted students to understand technology and how it can be used as an instrument of change. The grand scheme was to have them use technology simultaneously to improve the air quality and to help expand an industry full of new employment opportunities.

From the research on disasters and technology, the program then moved in to look more specifically at the need for electric vehicles. A simple exercise illustrated the polluting power of gasoline-powered vehicles: Teachers placed a white sock over the exhaust pipe of a car. It did not stay white. Next, students gained a sense of how many cars were having that effect by calling the registry of motor vehicles and requesting the number of cars registered in Massachusetts and in Cambridge. (One of the teachers had called the registry first to pave the way.)

As the year progressed, a number of problems surfaced. Students not directly involved in construction of the vehicle felt their work was not real or important. The electric vehicle was taking longer than anticipated, and student interest was diminishing without an actual completed vehicle as the central focus. Some teachers needed a structured curriculum, and without a humanities instructor involved, the technical teachers became frustrated wrestling with students' writing skills.

Moreover, most students had found a comfort zone and were not choosing to rotate at the end of each quarter. Staff chose not to force them to change because that most likely would just have resulted in disinterested students not learning anything and disrupting the class—one of the problems with the old exploratory program. Consequently, many students saw only one technical area, and they did not gain any sense of how skills in different aspects of industry (such as planning and finance) could transfer to other industries. A skill may be "transferable" in theory, but students need to use it in multiple contexts to realize that and to gain the ability to transfer and adapt their skills to new applications.

Toward the end of the year, the staff stepped back and took a critical look at the Electric Vehicle Project, assessing whether and how the tenth grade should change. They listed everything worth saving: school-based enterprise or community service; interdisciplinary, project-based curriculum; portfolio assessment; and research projects. Then they listed items that needed to improve dramatically: the inclusion of labor issues; maintaining staff and student interest; teaching of communication skills; aiding students in processing what they have learned; academic instructor involvement; time constraints; and student rotation through technical areas.

Despite the difficulties, the first electric vehicle was completed. Staff decided that, although the electric vehicle project was not ideal for the tenth grade, it was still a great learning opportunity. Consequently, the Electric Vehicle Project born in the sophomore program is now a school-based enterprise within the Industrial Technology and Engineering career path, and junior and senior students continue to convert vehicles and study the industry. Harvard University is interested in converting some of its vehicles and setting up an internship, with students doing the work and maintaining the vehicles at Harvard. The enterprise targets nonprofit entities as customers, and other interested parties are the public works and traffic departments from the city of Cambridge. The first vehicle is now used as a demo model and test platform.

The Tenth Grade in 1993-1994: Industries and Humanities

Industries

Building on what they had learned from the Electric Vehicle Project, we developed the Industries Program for 1993-1994. We used many of the daily team meetings to design the Industries course, which was built around the idea of running a series of microenterprises with students rotating through four technical areas, one each quarter. Students selected three technical areas in September, visiting one each quarter, and at the end of the third quarter they could select a fourth area or return to their favorite. Technical areas included electronics, culinary, carpentry, electrical, drafting, video, computers, graphics, and transportation. In the computer area, for instance, students could use desktop publishing software to create and produce greeting cards, calendars, or other products.

Drawing from a jointly developed curriculum, all of the technical areas would be work toward common goals. Students rotating through would apply the same skills—planning, management, finance, and so on—in a different context each quarter, reinforcing the portability and transferability of these skills, while improving on them. With each rotation, students would create an enterprise or a community service endeavor. The teacher had the option of allowing students to create their own or proceed with a predetermined one. This allowed teachers to operate comfortably. Each enterprise had to meet four criteria: (1) use of the materials, tools, and equipment in the technical area; (2) use of the skills and strengths of all members of the group; (3) the meeting of a need of all or part of the community (the high school and surrounding neighborhood); and (4) the process of breaking even or making a profit. The enterprises would provide a fun, experiential setting. This was the general plan—now all that had to be done was to work backwards and fill in the blanks.

Humanities

The tenth-grade language arts and social studies course at Rindge is called Humanities. In the Commonwealth of Massachusetts, the ninth-grade year generally includes a course in World History and the tenth-grade year includes a course in American History. To some degree, then, the most general content of the tenth-grade Humanities course was predetermined.

The Humanities teachers had decided to take an integrated, American studies approach to teaching American History. From the beginning, they designed the course around thematic units on such subjects as Native American history and the Civil Rights Movement, which included both traditional social studies content and associated activities and materials ranging from novels and poetry to film and vocabulary words. A unit on Civil Rights, for example, included reflective writing, reading "The Autobiography of Malcolm X," critical viewing of both documentary and dramatic films about the period, studying how constitutional law affected the Civil Rights struggle, reading oral histories, and even listening to the music that Malcolm X had enjoyed during his "hipster" period.

Industries and Humanities constituted the core tenth-grade Rindge program. At that time (1993-1994) and in the following year, as well, Rindge students still took mathematics and science (as well as physical education and nonvocational electives) in other "houses" of the high school.

Our Team Plan: Use AAI as the Bridge Between Vocational and Academic Learning in Tenth Grade

Our design team consisted of three new teachers (one responsible for Graphic Arts and two who co-taught U.S. History/Humanities) and one more experienced vocational teacher who had played a leading role in the school's reform efforts since 1991 and who was very involved in designing Industries. When we first met in the fall of 1993, we were all just embarking on the first year of both Industries and Humanities. Given that we all taught either Industries or Humanities, it was not a great leap to focus on the tenth grade. (Of course, we had been chosen largely for that reason because we had a sense that the tenth grade needed some cohesion.)

We decided to use AAI as the mechanism for integrating Industries and Humanities. While in Industries we tried to teach AAI, it was only within the confines of a microenterprise, making it hard to bring out historical changes or issues that arise in larger enterprises such as changes in technology and labor issues. Humanities teachers, on the other hand, had already planned to do a unit on labor history, but it was mostly focused on understanding and knowledge, as opposed to skills.

Our general approach was to use the vocational course to teach all aspects of an enterprise, and the humanities course to broaden that to the industry as a whole and to bring in a critical perspective. For instance, Industries teachers looked at the organization of labor in the enterprise and Humanities teachers taught labor history. This both solved some dilemmas (we had not been able to figure out how to teach labor issues very well within the confines of microenterprises) and allowed us to bring the two courses together.

In Industries, we sought to treat the high school as an economic community and to operate the enterprises as regular businesses. We adopted approaches and materials for the Industries curriculum from REAL (Rural Entrepreneurship through Action Learning), which has developed an experiential curriculum for business development. This curriculum breaks a business plan into exciting hands-on activities and terminology easily understood by students and staff. For marketing and sales activities, we used projects from NIFTE (National Institute for Training in Entrepreneurship). A member of our team, who was trained by REAL, was available to come in if the technical teacher felt uncomfortable leading the exercise.

At the beginning of the year, to help students get accustomed to thinking creatively about potential products and to introduce the concepts of product design and development, Industries used an exercise from REAL: Each team of students was given a spoon and asked to design a better product to accomplish the same task. Then the course segued into the first technical area. Each quarter, students conducted health and safety audits for that technical area and did some hands-on activities in the shop to build some skills with the tools and technologies.

As part of their research and planning for the enterprise, students assessed human and material resources and needs within the school, in part through interviewing school staff about what the staff did. Field trips enabled students to learn about other firms in the industry. Using REAL exercises, students profiled potential customers. As in the Electric

Vehicle Project, Industries incorporated library research. Students used a directory of manufacturers and relevant magazines to identify suppliers and then priced stock.

To start the enterprise, students produced a prototype—be it a calendar, a wooden cutting board, or another product—and established the time of production. They then wrote an operating plan and job descriptions, and developed a system to keep track of orders. The teachers wanted students to do break-even analyses. To introduce the idea and skills involved, they led into it with a personal futures exercise, in which students envisioned where they wanted to be and how much money they wanted to make ten years hence. Using the yellow pages and calling stores, they estimated the cost of furniture and other needs and determined the cost of living. Having gotten used to the methods, they did break-even plans for the enterprise. After students had operated the enterprise for a few weeks, the plan was for them to break it down and evaluate it in the last week of the quarter. (Thus, each quarter, students spent only a few weeks actually operating the enterprise.)

The Humanities course complemented Industries. We found that an integrated humanities approach lends itself readily to the goals of AAI instruction. Some aspects, such as technical and production skills, clearly fell within the purview of Industries. We addressed others, such as management, planning, and finance, mostly on the microenterprise level within the Industries course. Humanities touched on those issues, but did not spend a great deal of time on them. However, we spent a great deal of time exploring community issues, labor issues (in part through a unit centered around the novel *Of Mice and Men*), and even the underlying principles of technology (one of our team members has worked as a historian of technology).

Some of the most successful AAI course content was actually quite sophisticated. We spent the better part of two weeks in Humanities exploring how the Industrial Revolution affected labor/management relations using simulations, lectures, discussions, and reflective writing. A good deal of the content revolved around the transition from "task-oriented production" to "time-oriented production" and the impact of "Taylorism" and related "time-study" management systems on the workplace. This unit also included a discussion of the ways in which public schools mirror the organization of a traditional factory and some historical background on the ways in which public schools were designed to meet the needs of factories.

It was gratifying to see Cambridge public high school students grapple with the same ideas that would be taught across the street at Harvard in a course on Labor History. We designed our assignments to test understanding of these concepts, not merely memorization; it was even more gratifying (and perhaps even a bit surprising) to see how many of our students had truly mastered these ideas.

Stepping Back Once More: Reassessing Industries

As the year progressed, Industries faced multiple challenges. The time problem was our biggest obstacle. First, students spent only one period (about 40 minutes) a day in Industries. Most businesses cannot function on only 40 minutes a day. Students would call suppliers and leave messages, only to have the supplier call back when they were not in class. This slowed the pace and often forced the teacher to take care of tasks and make decisions, taking away from the student experience. For the electrical area, where the enterprise was a small appliance repair company, it proved fatal. By the time students had diagnosed the problem, identified the broken part, ordered the part, and then fixed the appliance, two months had passed. It was a lesson in market demand: Consumers are not willing to wait that long for their appliances to be fixed.

The second aspect of the time problem was only having students for one quarter. The different technical areas had varied degrees of success in being able to get enterprises up and running each quarter. For some, it just was not feasible. The technical areas that actually ran enterprises generated the most student interest for the fourth-quarter selections. Desktop publishing lent itself well to microenterprise development. Students established a greeting card publishing company, called All Seasons, which designed and produced cards in different languages for various ethnic holidays. (With Cambridge's large immigrant population and with 46 languages spoken in the high school, All Seasons met a large need.)

When using a school-based enterprise as a learning experience, the depth of learning relates to the volume of business. The more business, the greater the variety of situations the students have to face and problems they have to solve. There are a certain number of curve balls that the teacher can throw into the program to raise practical problems and issues, but students realize the artificiality. We concluded that enterprises are better as semester, full-year, or even multiyear experiences, so students can both plan and problem solve once the enterprise is in action.

In addition to time problems, coordination between Industries and Humanities was extremely difficult, since the Humanities teacher taught during Industries staff meetings. Faced with the choice between having both Industries and Humanities teachers meet together each day or having the Industries and Humanities classes scheduled back-to-back, we had chosen the latter. We believed that we would need the back-to-back classes in order to take students out of the building for industry visits, obtaining supplies, and so on. In retrospect, we would choose the joint planning time. (Obviously, a schedule that allowed for both would be ideal.) With curriculum for both classes being developed as the year progressed, we missed opportunities to reinforce each other.

We also struggled with the issue of student choice versus teacher preparation. At any given moment, in a single Humanities class, students were studying four or five different industries. If each student got to do something regarding that industry, the Humanities teachers would have had to be prepared to coach work in, say, carpentry, culinary, drafting, electronics, and electrical. This posed a problem as we considered research projects and oral histories. Students would need coaching and help in identifying information sources. The amount of teacher preparation demanded was unrealistic, especially for first-year teachers. The lack of common planning time with the Industries teachers augmented the problem. Some of the ideas would have been more feasible if the Industries and Humanities teachers had more planning time together, or even better, were team teaching the class.

Finally, Industries continued to suffer from one of the same ailments that had afflicted the Electric Vehicle Project: rotation syndrome. Students did not want to rotate out of technical areas where they felt comfortable. If we let them stay, they would lose out on learning about other areas and practicing transferring skills. If we forced them to rotate, the program would begin to feel like the old exploratory program.

By the end of the school year, the Rindge staff decided that, although it was a big improvement over the Electric Vehicle Project for tenth graders, Industries would have to be restructured. The core idea—of students developing and operating microenterprises—

was adapted for an entrepreneurship class and for upper-grade enterprises in the four career paths—both of which are discussed later in this chapter.

The Evolution into a New Program for 1994-1995 and Beyond: Pathways and Humanities

Since the fall of 1994, all Rindge sophomores have taken Pathways (the new tenth-grade "vocational" class) and Humanities (U.S. History and Humanities).

In Pathways, students spend each quarter exploring one of the four career paths around which junior and senior studies are structured—(1) Business and Entrepreneurship; (2) Arts and Communication; (3) Industrial Technologies and Engineering; and (4) Health and Human Services. Rather than having students rotate to different areas, each taught by a different teacher (as in Industries), Pathways is taught mainly by one teacher, who was a member of our AAI team. Teachers from the different career paths join the Pathways teacher to help design projects and co-teach the class. Pathways integrates job shadowing, career interviews, presentations, projects, inventions, and case studies. A chart in the Supporting Materials titled "Overview: Our School" shows the elements of the course, which is one period a day.

The text for Pathways is work—not just careers, but the relationship of work to society, to the daily living experience. We want students to think about what work is and what a career pathway might be. Projects and writing assignments call upon students to relate academic skills to the demands of workplaces and involve students in reflecting on the value and meaning of work in their lives.

Based on the work done the year before, we have used AAI as an ongoing theme for Pathways. In each quarter, we highlight two aspects. For instance, in the first quarter, while students investigate the Business and Entrepreneurs Career Path, they focus on finance and management. In their job shadowing experience at Smith Barney or at Ledge Multimedia (a local multimedia start-up company), students focus on those aspects of the industry. They then work in teams to prepare presentations. As two new aspects are introduced each quarter, students gather information on those aspects—in addition to the aspects introduced in previous quarters—as they do job shadows and projects.

The job shadows are the cornerstone of the class because they make the rest of it more real to students. At the beginning of each quarter, each of the participating employers joins us for a "Job Shadow Fair," where they make presentations to the students. Based on that information, students sign up for job shadows and then follow these steps:

1. Formulate a questionnaire with some general questions and some specific to that industry for interviewing the job shadow host.
2 Make an appointment with the host by telephone.
3. Design a transportation plan and get it approved by the Pathways teachers.
4. Show up promptly at the worksite and take notes.
5. Send a thank you letter to the host.
6. Report on the job shadow experience, orally in class and in writing.

Each student does two job shadows per quarter, with each job shadow lasting about three hours (either a morning block or an afternoon block). (Our urban setting gives us the advantage of having many public and private employers within the distance of a bus or subway ride.) Because class time is spent largely working on projects, it is not a problem that different students are away at job shadows on different days. We have had only occasional difficulties with students missing their other classes. But since it is only eight times a year, students are not missing the same classes each time.

In terms of liability, we treat the expedition like a field trip. Parents sign a release, and we rely on school insurance. Only one parent out of 75 students in the 1995-1996 school year would not agree to the release. We compromised, agreeing that the student would have to do job shadows at sometime before graduation.

We want students to learn to take responsibility and to feel confident in going outside their neighborhoods and in talking to business people and potential employers. Students begin to build these skills in the ninth grade in CityWorks, where they interview people and produce guides to the city of Cambridge. When students make their Pathways job shadow appointments and set up their own transportation plans, they are strengthening those skills. This may not seem like a major issue to some, but it is in an urban environment. We have to deal with turf issues and the continuing segregation of immigrant communities. Some of our students have never been to downtown Boston, just a subway ride away. In the future, we would like to experiment with having students take an increasing amount of responsibility for setting up their job shadowing experiences—identifying potential firms or agencies and then calling them to explain the program.

Complementing the job shadow, students complete a variety of projects. During the first quarter, while studying in the Business and Entrepreneurs classes, students develop and run a microenterprise. Much of this curriculum draws on the Industries curriculum, but the enterprises are on a smaller scale. Limiting "the market" to other students and school staff gives us more flexibility, so that students have time to generate and follow up on their own business ideas. (Similar projects are used in the Entrepreneurs class, which is described below.)

We also use smaller projects to introduce skills and to stimulate students' creativity. In the Slug Slime Project, teams of students list all the things they could make with Slug Slime. They then pass the three hardest or worst product ideas on to another team. Each team then has to pick the one they think is the worst and create posters extolling the virtues of that product.

Taking a different spin on the spoon exercise from Industries, we teach product differentiation using pens. Students analyze features of different pens and survey other students and school staff to figure out what sells and why. Then they design a different pen with the consumer in mind.

Pathways includes a career speaker series, drawing in part on contacts we made during our research for Industries. We also take whole class field trips. One such trip was to USAir, where students saw ticketing, piloting, and air traffic control functions in the new facility at Boston's Logan Airport.

We try to build on the community development focus of CityWorks in job shadows (particularly when studying community issues) and with projects. One project we are thinking of is "Where do you spend your money?" Students would draw maps of their neighborhoods showing where they spend their money each month. To determine whether the money they spend stays in the neighborhood, they could call or visit the businesses to find out whether the owners and employees live there. In interviews of friends, adults, and elderly people in the neighborhood, they could ask them what they buy locally, what they leave the area to buy, what the most important considerations in their spending decisions are, and what products or services they would like to have available in their neighborhoods. Using the results of their surveys, students could identify some kinds of businesses that might do well in their areas, perhaps because there are no businesses of that type or because the local businesses are too expensive, offer poor services, or are unsatisfactory in some other way.

As in most of the Rindge classes, Pathways requires that students keep journals, sometimes assigning specific topics. Students keep their reports and projects in portfolios, which along with written exams and vocabulary quizzes, form the basis for their grade.

With the Pathways program, we can better integrate the humanities with vocational studies. Both courses use different lenses to view the world of work. The Pathways teacher previously co-taught Humanities. This has also helped to facilitate integration because the Pathways teacher understands the goals and the flow of the Humanities class, and because the two teachers have built a strong professional relationship and are comfortable in one another's classes.

Our team's curricular work of weaving AAI into Humanities is still utilized. Labor issues, in particular, remain a major theme in Humanities. In Humanities, we take a broad brush at industrial history, how labor and industry have developed since the Civil War. Many of the readings are snapshots of people dealing with labor issues at different points in time. The curriculum is built partly on *The Power in Our Hands* and *Law in U.S. History* books/curricula, and it includes videos on the Depression and *Out of Darkness: The Mine Workers Story*.

While there is no common planning time or direct coordination between the Pathways staff and the Humanities teachers, the Humanities program continues to stress issues of labor and power relations and now places an increased emphasis on developing student skills that will be of use to students in almost any employment setting, be it blue-collar or white. For example, students work together in cooperative teams, present findings and projects to the class on a regular basis, and are coached in skills such as public speaking and interviewing.

We would like, in the future, to have students do oral histories—to view the different aspects of an industry and historical changes through the eyes of an individual. We originally wanted to have students do them in 1993-1994, as part of Industries and Humanities. We realized then that we could not because it required building students' skills first, especially in interviewing. We would like to try to build up to oral history projects in future years. Students could first interview one another and their teachers about work experiences—"How did you get your first job?" "What did you like best?" "Least?" "What were health and safety issues?" "Were you in a union?" and "What kinds of technology did you use then?" We could build from there to more extensive interviews and then to videotaped projects.

1995-1996 is the first year that we were able to offer tenth-grade science within Rindge. Most Rindge tenth graders now take Introduction to Technology, which gives science credit, but also includes a good deal of mathematics. A design team of five technology teachers and one science teacher worked on the course during the summer of 1995 and now meet weekly to continue its development.

Introduction to Technology utilizes Cambridge Physics Outlet's materials: simple, hands-on equipment that is fun and academically rigorous. Using a car and ramp, a pendulum, a roller coaster, and other pieces, Introduction to Technology helps students to understand the relationship between what they see and a scientific formula. It also integrates graphing and algebra. (More information on the Cambridge Physics Outlet is included in this book's resource chapter.) Students will also study uses of technology in the school such as energy management. Because this is a new course, we are still working on how it will relate to Pathways and Humanities.

Spin-Offs and Complementary Changes: Entrepreneurship, School-Based Enterprises, and the Community Service Corps

The idea of microenterprise development now runs through Rindge in a couple of ways. Not only does Pathways use some of the ideas from Industries, but we now offer a class on entrepreneurship, where students can develop and then spin-off enterprises. The full-year class allows for more student control so that they can generate and test ideas.

Some of the enterprises for Industries have been expanded for the upper grades. Students now use desktop publishing technology not only for greeting cards and calendars, but also to create publications for the preschool and elementary school audience. Rindge students make vocabulary flash cards in Spanish, French, and Portuguese, using a bilingual dictionary to translate vocabulary words according to grade level. They create African-American and Hispanic-American history puzzles by selecting and researching a theme, writing a two-page report on it, and making a wordsearch puzzle using key words. Other products include math flash cards, vocabulary workbooks, personalized calendars, and thematic coloring books. The emphasis throughout is on helping students to express themselves in writing and to acquire desktop publishing skills by capitalizing on their interest in computers and the entertaining nature of the products.

One direction we would like to pursue further is that of community service as a way to engage students and to embed AAI learning. There are many things students could do within their communities that would empower them and place them in leadership roles. We have begun a comprehensive service learning program that integrates internships with ideas concerning community economic development. In 1995-1996, seventeen juniors and seniors are participating in the Cambridge Service Corps. Community Problem Solving 101 serves as the curricular foundation for the work of the Corps. The course runs the length of the academic year, meeting every school day for one or two periods and including several hours per week of structured after-school time. Comprising close to half of the students' entire courseload, it is credited as a combination of social studies, English language arts, and vocational/technical arts. We hope to integrate mathematics and science in the future.

During the course of the year, Cambridge Service Corps students will explore neighborhoods, do weekly service placements, conduct real-world case studies, inventory local resources, and work together to develop a shared vision for the city. They will decide as a team what issue to target and will then develop and lead a culminating community-wide service project that reaches out to the broader community through town meetings, a City Council presentation, a cable television appearance, newspaper commentaries, recruitment of volunteers, and solicitation of donations.

Reflections on AAI

When AAI was first introduced to the staff at Rindge, the general opinion was, "no problem; we are already doing that." To some extent that was true; to a major extent that was untrue. "As a teacher, I wanted to believe I was teaching it; as a small business owner, I knew I had to teach it." Realization that we were not really covering enough beyond technical skills and safety came the first year of CityWorks—along with a new approach to teaching. It became okay not to have all the answers; it was actually fun learning with the students. As we strive to improve our programs year after year we realize we are just scratching the surface of AAI instruction. It is a constant give and take, trying to find a compromise between time, curriculum content, and methodology.

From the start, teachers who had experience in industry found the AAI approach validating; it affirmed what they knew from their own experience. For other teachers, the relationship to community issues resonated with their own concerns. They were excited that vocational reforms allowed them to address some of the city's problems.

There are two mindsets at Rindge about how AAI should be taught. Some staff members feel it should be taught by instructors in a classroom setting—for example, planning, finance, and management should be taught by a business teacher; and labor and community issues taught by a history teacher. One problem with this approach is that learning becomes fragmented. It is difficult to see how the piece fits into the whole picture, and it takes a creative approach to maintain student interest. On the plus side, it makes a nice, neat package; it is easy to schedule and coordinate curriculum because you are controlling the experience, unlike an actual workplace.

The other mindset holds that AAI should be woven into common themes, school-based-enterprises, and projects across the program, in both vocational and academic courses, with an experiential focus. This is the approach Rindge has been taking, for the most part, and it is our preference. Students learn about AAI through doing, as they work on enterprises and projects, and they learn about it with the help of a mix of teachers, businesses, and community people. More traditional classroom teaching reinforces the students' experiences. Students experience the need to know, realize how the piece fits into the big picture, and develop an understanding, which is arguably better than knowing information, but not knowing how to use it. On the flip side, the drawbacks to this approach are the logistical nightmares and the challenge of finding ways to integrate different aspects and issues so that students see how what they learn in one class or project relates to what they learn in another. This approach also demands that teachers coach students to help them sort through information from different people and perspectives—a challenge, but a good one, because it helps strengthen students' critical abilities.

AAI needs a context to be meaningful. We struggle constantly with how to make it real and concrete. It is good for students to learn what planning is, management, and so on, but if you have a separate exercise on each aspect, it becomes too detached from what the students are interested in. Kids tune out. Some of us feel, though, that it is important for students to see that various aspects are differentiated—that there are labor issues (and other aspects) that they should be able to recognize as such. The challenge is to include and identify the aspects without making it too abstract. We use microenterprise development a lot because it helps us to strike that balance.

The same challenge—of avoiding being too abstract—arises in discussions of vocational and academic integration. Some things seem to fit together beautifully in curriculum meetings, but they just do not connect for students. In CityWorld (the ninth-grade social studies course), we tried to build the curriculum partly around cities in other times, such as Mesopotamia, where students study many of the same systems and issues that they examined in CityWorks, in the context of their home city, Cambridge. It was too abstract of a connection. For 1995-1996, CityWorld is trying a new approach. Students began the year by watching the movie "Frankenstein" and discussing the nature of being human. Is one born human, or can you become human? Students were excited and engaged. The plan in CityWorld, then, is to segue from human development into ever-widening groups and structures (cities, nations) as the year proceeds, and in that way relate to the study of the city going on in CityWorks. With less reliance on a common theme, integration of learning in the ninth grade is more explicitly oriented with teaching certain habits of mind, like the scientific method mentioned earlier in this chapter.

Thoughts on the School Change Process

As first-year teachers, we were eager to learn about the resources in the school and find out about what other teachers were doing. Because it touches on so many subjects and ideas, both vocational and academic, AAI was a good focus for reaching out. (Veteran teachers want to find out what is going on elsewhere, but also are uneasy about people examining what they are doing, so it is more complicated for them.) As new teachers, we also really liked the idea of having a leadership role in the school—not just being told to follow along with what others had designed. It was important to us that we were being trusted to represent our colleagues. Of course, there were disadvantages to our team being three-quarters new teachers; we had a tendency toward goal overload and stress.

We had hoped that since Industries and Humanities were new, it would be easier to build in AAI from the start. We were going to have to develop curriculum for the year, anyway. There were definitely advantages to that, but there was also a disadvantage—goal overload. As the year went on, our idea of what we would be able to do in that school year grew progressively smaller. When we first met in October, we thought that we would do a big AAI project in the second quarter—maybe an oral history. As it became later in the fall and winter, we planned for the third quarter, then the final term. We finally agreed to just continue to experiment throughout the year. That proved useful because it took the pressure off us and gave us the freedom to make mistakes. What we learned through our research and experiments shaped the new Pathways course, as well as the Humanities curriculum.

We found that it was unrealistic to expect someone teaching full-time to find the time to do research, especially research that requires making calls or going to libraries during Monday-Friday working hours. For example, we would like to look at microenterprise in other countries, bringing in issues of how to stimulate and direct economic development, the roles of banks, and so on. It is a neat idea, but we have not been able to follow up on it yet. One option we found to alleviate the time problem was to involve one of our student teachers in the development effort. She helped us put some other ideas into action by finding readings and other information for us. For other teachers, it might be a good idea to have a college or graduate student who could play such research roles.

Throughout our team's work, we kept coming back to the question of when we, the core design team, should involve the other teachers. We did not want to develop something and then hand it to them because we would not get buy-in. On the other hand, we knew that if we brought the ideas to others too early, they might reject the whole effort as too vague, not feasible. Our general approach was to go to the other teachers with a preliminary plan and let them punch holes in it, then revise the plan. We all agreed that you cannot do the nuts-and-bolts work as a group. It is better to use a group to brainstorm ideas.

The importance of our physical settings has become more evident as we have tried different programs. In the programs that have involved vocational teachers staying in their shops (such as the Electric Vehicle Project and Industries), vocational teachers have found themselves slipping into old habits, doing what they have always done. That tendency works against new efforts to integrate subject areas and to increase emphasis on the nontechnical aspects of the industry (such as finance). Part of the success of Pathways is that it is based in a different space. Students visit the shop areas to work for specific projects, but then return to the Pathways room. During 1995-1996, Rindge is converting half of the carpentry shop into a "tech lab" for the Introductions to Technology class. Ideally, all of the shops would be transformed into centers of technology designed for multidisciplinary projects. The difficulty, of course, is the expense.

Our work on AAI and vocational and academic integration brought to the forefront some issues that usually stay under the table. If we were going to do in-depth integration, we needed to agree on the expected outcomes. Teachers do not usually do that—especially across disciplines. We were used to making our own decisions for the classes we teach. Now, we find ourselves struggling to balance coverage of material with depth of understanding.

Offering academic subjects in a vocational context presents teachers and administrators with a number of interesting choices. The first choice is whether to teach academic courses "in-house" at all. This decision must be made before any decisions about course style or content can be made. Socioeconomic factors are a major consideration. Vocational students tend to be socioeconomically disadvantaged when compared to most other school populations at Cambridge Rindge and Latin School (CRLS), the general high school with which Rindge is affiliated. As Rindge has grown and changed, it has attracted a more diverse student population; however, the school still enrolls a higher percentage of at-risk students than any other CRLS program, and the socioeconomic status of the parents remains the best statistical predictor of who will enroll in Rindge.

The argument made by opponents of in-house academics is that these classes can concentrate on students with behavioral and academic problems and may be perceived as an educational ghetto removed from the high school mainstream. The argument made by proponents of in-house academics is that in-house classes build solidarity and community, can be more specifically tailored to the needs of the students, and most important of all, offer at least the potential for integration with vocational studies. One additional benefit of in-house classes is that they allow students to avoid having their classroom experiences dominated by the stereotyping of vocational students that sometimes takes place (or so students report) in classes taught outside the house. Rindge students who receive academic instruction in other houses are almost unanimous in saying that they are stereotyped in the rest of the school. Little is expected of them, and they are often made to feel like second-class citizens. As discussed above, Rindge has been moving towards an "in-house" model for academic teaching.

One issue that is too central to completely ignore, but also too large to discuss at any length in this context, is the tracking that occurs within schools and the reality that, in many schools, vocational education continues to function as an academic "dumping ground." Many factors are involved, most notably socioeconomic discrimination, racial discrimination, deindustrialization, socioeconomic decline, and the tendency of Americans to denigrate even the most highly skilled manual labor.

We see at least two negative consequences of tracking. One is that some students have less access to challenging educational, particularly academic, opportunities. The other is segregation. In Cambridge, where a desegregation order requires that all of the houses in the high school have roughly the same racial composition, the groupings tend to be by family income.

Tracking thrives on a lack of access to rigorous academics. Access is not just offering the course but offering the subject matter in a way that all students can learn it. Our hope at Rindge is that by bringing academics in-house and using experiential methods (via vocational-academic integration), we can make strong academics more accessible.

We also want to directly counter the idea that some students should be prepared to go to college and to white-collar jobs, and others should be trained to go directly into blue-collar employment. We are trying to educate all of our students so that they are prepared for both routes. Because it crosses white- and blue-collar lines and blurs the distinction between vocational and academic learning, an AAI approach improves our ability to do that.

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SOUTH DIVISION HIGH SCHOOL

Abstract

As with Oakland, the teachers in the Hospitality School-to-Work Integrated Studies (SWIS) Program were in the process of creating and implementing a school-within-a-school. Unlike Oakland, the hospitality program is part of the larger vision to implement school-to-work programs districtwide. In addition, at the time of this case study, the program was just in its second year. While on one hand it represent marvelous innovation, a lighthouse in its school, it also portrays issues and dilemmas that are key to many programs around the country in their earlier years of development. As teachers tell their tale of the creation of AAI projects, they also convey the reality of transforming vocational programs into broadly conceived multipurpose structures. Thus, in addition to sharing their philosophy about projects and how to transform them from within the jurisdiction of one teacher to a multidisciplinary team, they also treat readers to an in-depth look at core dilemmas such as status issues in vocational programs, team-building, grafting new ideas on to old reforms, teacher resistance, and a lack of time and support.

SOUTH DIVISION HIGH SCHOOL
SCHOOL-TO-WORK INTEGRATED STUDIES: HOSPITALITY INDUSTRY

by Barbara Anderson, Phil Balwinski, Sue Eskuche, and Bob Ilk

Introduction

Trying to get a group of teachers to agree on the color of the ceiling is a difficult task. And they want us to teach together? To adapt to one another's curriculum and teaching rhythm? They want us to perform a miracle. Eight different professionals, eight different agendas, eight different areas of expertise . . . teaching together . . . trying to survive . . . together. Where do we begin?

After assessing the situation at South Division High School, we began with the knowledge that we were all competent, caring teachers. And we wanted students to learn OUR subject matter. Now we needed to want students to learn ALL subject matter. Why was this so difficult? We had different areas of expertise but not different agendas.

This integration of subject areas, this inclusion of AAI into everyone's neat, clean, little curriculum is painful. This expansion of traditional curriculum across the hallway is undefined. Opening the outside doors of a school to industry is frightening. What do any of us know about the other? Nothing. And that was what WAS wrong.

This is the story of a group of teachers at South Division High School in Milwaukee, Wisconsin, and the group's journey as it traveled along the path of educational reform. It is a road that integrates a vocational program called Hospitality Management with the academics and the meshing of AAI into the curriculum.

We would like to share our work walk with you. We would like to share our successes, as well as tell you about the roadblocks we have stumbled upon along our path. We would like to share how we became a team of teachers who respected one another's curriculum and shared a common purpose.

Our journey begins at South Division High School, a large, urban high school located on the near the south side of Milwaukee. Milwaukee, with a population of a little more than 600,000, has fifteen high schools all dealing with the same challenges of many urban high schools.

South Division is a school with a considerable history. In 1993, the school and alumni celebrated its centennial. And while the school is 100 years old, the recent facility was built in 1977. The school is big, bright, and a community showcase. One hundred years ago the community surrounding South Division was newly settled with Polish immigrants. Today the area is home to much of Milwaukee's Hispanic community, Southeast Asians, and many new immigrants to the United States. Poverty, crime, gangs, and teen pregnancy are a sad reality for many of our students.

Since the christening of the new building, we have seen many changes, reforms, and initiatives. Just prior to moving into the new school, Milwaukee, along with other urban school districts, was dealing with the issue of desegregation. Milwaukee's superintendent, Lee McMurrin, proposed an idea entitled "High Schools Unlimited," in which each senior high school, in addition to providing a basic program, would serve as a magnet to draw students from across the city as well as from other school districts. This specialty or magnet school concept was used as a tool for integration in the first phase of compliance for desegregation. In addition, it also laid the early groundwork for our integrated curriculum efforts and industry-focused programs. Desegregation gave us some deep roots. We planted a lot of seeds before it was the "thing to do."

To determine what specialties would be offered, a task force was established to determine where the jobs would be in the 1980s and 1990s. One area the task force felt strongly about in Wisconsin was in the area of recreation, tourism, and food service. These three specialties were put under an umbrella called "The Leisure Time Occupations" (now called Hospitality Management). Although there was opposition from members of South Division's community regarding the subservient image of the specialties, they opened with the new high school in 1977.

The tourism curriculum is designed to prepare students for careers in the expanding travel and tourism industries. The program is housed in a facility called the Hospitality Center. As one enters the facility, one sees a front-desk area that was designed by the Wisconsin Innkeepers. The front desk is adjoined by a mock hotel lobby and a simulated guest room. The lobby area is next to a restaurant dining room which adjoins a state-of-the-art kitchen that has equipment to allow for the development of skills in the fast food, institutional, and commercial operations. The Recreation Specialty which prepares students for careers in sports, parks, and recreation is housed in a large field house.

South Division, with a student population of 1,800, is the most culturally diverse school in Wisconsin. Three percent of the population are Native American, 24% African American, 5% Asian, 52% Hispanic, and 16% white. The attendance rate is 75% and a typical grade point average is 1.43.

In an effort to address the problems and lack of achievement of many students, South Division has seen many changes and many reforms since the new school opened. Seventeen years and seven principals later, the three specialties are still an active force within the school. However, we have changed with the years, and there have been many influences on what and how we teach today and the road we have traveled.

There are many forces driving our curriculum along its path. In 1988, there was concern among the community that we were training our students for skilled jobs and not for higher-level managerial positions. (All Aspects of the Industry [AAI], where were you then?) Our answer was to strengthen the postsecondary options available to our students. Articulation agreements with Milwaukee Area Technical College and formal partnerships with the Universities of Wisconsin at Stout and LaCrosse have had a positive impact on our curriculum, programs, and the successes of our graduates.

The three hospitality vocational programs at South, while all under the same umbrella, were in separate departments and were offered as separate programs. Because of our articulation partnership, more and more of our students went on to postsecondary education. What we found in postsecondary education curriculum, as well as in the industries of recreation, tourism, and food service was that they were not separate industries but a combined package. Consequently, in trying to meet the needs of postsecondary education, industry, our students, and our graduates, we began the first steps of our integration by combining all three programs at the freshman and sophomore levels and calling them Hospitality Management. At the junior and senior levels, we could give students the opportunity to specialize.

Different initiatives have opened new pathways along our road to reform. The Ford Foundation funded a program called Cardinal Academic Pride that worked with students on self-esteem; this was our first attempt at crosscurricular instruction. Outcome-Based Education came and went, yet this also taught us about alternative forms of assessment. The South Division vision brought technology into the school, a computer in every classroom, and eight student labs. In addition, the K-12 curriculum, a district initiative establishing goals and outcomes for all Milwaukee Public Schools, marked the beginning of school-to work district initiatives. Each of these reforms laid groundwork for the Hospitality Management Program, but none have had a greater impact than the pendulum swinging to Tech Prep.

In the 1992 school year, the Hospitality Management Program, along with a manufacturing program at South, began the first steps of an integrated program called School to Work Integrated Studies (SWIS). We started our integration efforts at the freshman level and integrated geography, English, and hospitality management. One geography teacher, two English teachers, and a hospitality management teacher comprised the team, and common planning was the key to the team's success the first year. Thematic units were created as a way to integrate the curriculum.

We expanded the program the next year, and we saw exciting things happening at the district level as well. The school board formally adopted the school-to-work concept in the fall of 1993 for all students K-12. The fall of 1993 also saw the continuation of a freshman SWIS team and the addition of a sophomore team. The sophomore team continued to integrate hospitality management, English, and social studies. The freshman team added two math teachers to the team.

Integrating AAI at South Division

AAI has offered a rich soil in which our curriculum can grow. The inclusion of the components of AAI into the Perkins Act has validated the integration of our vocational and academic curricula.

In 1993, after one year of integration under our belt, we were introduced to AAI. It was not a new concept. After all, we had always taught entrepreneurship, types of business organization, finance, labor relations, and so on, mostly in vocational classes. In addition, these aspects were taught in different subject areas, at different grade levels, and at different times during the year; thus, AAI was something that was woven in and out of our curriculum in a somewhat fragmented and implicit fashion. Our year working with the other schools in these case studies around AAI allowed us to broaden our curriculum. It gave us a whole new focus, as we moved from skill-specific to industry-wide transferable skills. Transferability was mutually desirable by vocational and academic teachers. The academic teachers wanted to make sure the knowledge and content of their areas was something that students saw as relevant. The vocational teacher needed the students to know math, English, and so on, to be successful. By integrating around AAI, students could better see why they had to know math, English, and so on.

The hospitality industry is a broad industry. By teaching AAI, we felt our students would be better prepared for career change within the hospitality industry. While we would like to think all of our graduates would continue with careers in hospitality, we knew this would not happen. The "meat" of AAI was in all industries. What our students understood about finance in the hospitality industry, they would be able to transfer to other careers. (Remember: We change careers five to eight times in a lifetime.)

We were also aware that many of the jobs our students would have were not even in existence today. The AAI platform, along with the integrated academics, allowed students to leave high school with broad skills in all aspects of an industry and to be prepared for the 21st century. Furthermore, we believed that AAI could be a platform for higher academics because we had increased expectations of what industry would demand. The inclusion of rigorous academic standards and AAI has prepared our students to move beyond entry-level jobs.

AAI gave a lot of substance to "our" old vocational program. Vocational programs have always had the stigma of being the dumping ground for the underachieving students. AAI creates respect between subject-area staff and students. It also creates a framework with which to work to merge vocational and academic instruction. AAI allows us to change with industry, where in the past we were three steps behind what the industry needed. AAI allows for transferability of skills and has moved us from a job-specific to an industry-wide focus.

AAI forced us to look at the internship sites where our senior-level students were placed. We needed to find training sites that offered students an opportunity to experience all aspects of an industry. Training plans needed to fall on the AAI format. AAI reinforced the need for shadowing opportunities for our students. Shadowing experiences needed to be directed towards management as opposed to specific entry-level occupations (i.e., the manager as opposed to the front office clerk).

Since the conception of our program, we have battled the negative image of our industry. AAI is a wonderful tool to change that perception. With AAI, we not only train our students for entry-level jobs, we broaden their horizons by allowing them to look at an entire industry. The issue is how to market that to the community.

When we taught AAI in isolation (prior to the NCRVE AAI project), our students had difficulty seeing the connection of AAI to the real world of industry. We found it was much easier to teach students AAI through a project. It was not always that way. We used to lecture with overheads as we individually dissected the parts of entrepreneurship, business, and so on. Yet, curriculum becomes more meaningful and applicable when taught through projects and woven in and out of a curriculum. Projects provide a way to connect AAI and to integrate it with the academics. As we looked at AAI and looked at the issues facing an industry, it became easy to teach issues using social studies, math, English, and so on.

While we feel that AAI is an excellent model of what every industry does, we learned that one crucial area was missing—the aspect that deals with human development. Human development encompasses goal setting, self-esteem, quality of work, ethics, responsibility, initiative, dependability, being a team player, and attitude. Since human development skills are essential to personal and industry successes, we feel obligated to teach and expect them from our students.

The Evolution of Project Orientation

AAI has also provided rich soil in which to integrate academics with vocational content. It gave a much broader focus to our curriculum and consequently gave us a lot more "meat" to teach with. Themes and units of study were so easy to pull from when using projects and integration in an AAI format. Project ideas were generated from input of industry advisory boards, student interest, vocational service organizations, school needs and requests, and local and state curriculum initiatives.

Before discussing the various projects that teachers have developed over the years, it is important for readers to understand the evolution and rational for becoming project oriented:

- *Instinct!*
  Projects come naturally to vocational subject areas. The expertise and experience involved in becoming a vocational subject-area teacher brings with it many successful project examples from postsecondary education and from industry work experience.

- Projects Are *Vehicles*.
  Teachers can apply the appropriate parts of their curriculum to a real project. The NEED to apply knowledge in order to successfully complete the project becomes a motivator for the student to pay attention to instruction and to learn how to do something with that knowledge. Curriculum flows naturally in and out of the project. Subject-area boundaries become blurred and education becomes integrated toward a common goal.

- Projects Are *Microcosms* of Industry.
  A project necessitates research and application of AAI in order to be successful. A project can be taken apart and examined for all the aspects of business.

- Projects Are a *Unifying* Tool.
  Students with diverse backgrounds, knowledge, and skill levels need to cooperate and share their knowledge and abilities to complete and enrich the quality of a classroom project. The common goal of project completion creates a sense of belonging so often missing in our schools today.

- Projects Create a *Hands-On* Activity.
  Students need to be actively involved in their education. Today's students need and want to be active, to move around, and "do" something, not just talk about doing it. A project can help explain to students the question of "Why do we have to learn this?" Conceiving, researching, planning, doing, and evaluating a project

can give students a finished project, something concrete to look at, touch, take home, or contribute to society and be proud of.

- Projects *Empower* Students.
  When students create and carry out a project, they feel part of the "outside" world. They can see where their skills and knowledge are used to earn a living. School and the real world become one.

And so, for many reasons, we in the Hospitality Management specialty at South Division built our curriculum around projects. Projects can be a product, such as cheesecake; a thematic project, such as travel; or a research paper, such as "career choices." Projects are happening right now; they are not futuristic. They are not about something that will happen sometime later in life.

We found it was hard for students to relate to an industry. Projects provided hands-on experience that helped students better relate to a broad industry. In addition, projects gave a group of integrated teachers a focus. It gave teachers support as they merged vocational and academics into projects that imitated the real world.

In the next section, we explain our initial team project for better utilizing AAI in our program. Within this section, we discuss our goals and planning, why our project did not work, how the original project changed, and next year's project.

The Original Plan

Goals and Planning

In the fall of 1993, we embarked on a project that we thought would be the answer to teaching AAI, the vehicle for integration of academics, and the pathway to the ultimate integration of the three main areas of the hospitality industry. We think that our struggle with this project, the inclusion of the AAI into our curriculum, and the integration of academics into the hospitality curriculum will interest you. The road to educational reform is not straight, smooth, or safe. Our destination is forever changing, so we had better enjoy the trip.

The plan was for the teachers and students, with the help of industry, to develop a "gift package" to promote the state of Wisconsin to prospective tourists. The students would research our state to determine what products we grow, raise, and produce. The students would also need to research the travel, tourism, recreational, and entertainment opportunities. The gift package would contain sample products either donated by the industry or produced by our students. The students would also need to create recreational and entertainment possibilities. These gift items would need to be packaged and sent to potential tourists all over the world.

Within this plan, we intended to produce a different "gift package" every school year. Hospitality management students from all grade levels would be involved in different aspects of the "package" during different times each year. The Level I students would do the research of our state, ultimately selecting the products to be included. Level III students would concentrate on developing a brochure to market Milwaukee and the other large cities as cultural and entertainment centers. They would need to research the community for ethnic, historical, and manufacturing of products for the "package" and do the assembly, packaging, and distribution of the product. Level IV would study AAI by being advisors/managers to the other levels. Having experienced the parts of other projects throughout the three previous years, they would be ready to consider and implement AAI with the other students. Because all four levels of students would have specific responsibilities over the course of their four years of high school, they would be involved in all aspects of the project, thus experiencing AAI.

Within this plan, we intended to integrate with the academic curriculum so that the students would be learning the knowledge and skills necessary to be successful in this project. The team tentatively planned to incorporate the following skills at the various levels:

Level I

Research—Library, written communication, geographic location, culture, history, science, and math skills, applicable to product selection, distribution, and manufacturing

Level II
Marketing, language development, design, and artistic skills; community interviews, research statistics, and demographics

Level III
Production skills; science and math skills for manufacturing, labor, and technology; finance, planning, health, safety, environment, and government

Level IV
Managerial, personnel, personal, critical thinking, and applications skills; conflict resolution

The timeliness of the academic curriculum would hopefully answer the question "Why do we need to learn this?" Geography, English, mathematics, science, foreign languages, speech, and history needed to be addressed at sometime in the project. We still feel this project is a workable idea. With the cooperation of staff, students, parents, community, and industry, the "gift package" can happen. The journey to making it happen is perhaps more important than actually getting there.

Why the Gift Package Didn't Work

One of the obstacles to implementation of the gift package was time. Not all of the teachers with the same level students had common planning time together. (We had to chuckle the first year of integration when some teachers were scheduled for common planning alone.) Without time to coordinate, we could not develop the ideas to be implemented. Time without students is expensive. Creativity in finding time to collaborate is often stifled by computers that program, administrators who do not understand, and teachers who do not cooperate.

Another major obstacle to the success of this project was the lack of a feeling of ownership of the idea by many of the SWIS staff involved. The idea originated at a workshop attended by only three of the many teachers who needed to be involved. As the number of staff involved in the integration of vocational and academic focus areas increased, the ability to process, coordinate, and implement ideas became more difficult. Teachers did not appreciate others coming up with the focus of their classroom presentations. It was truly a difficult task to cram "our" idea down someone else's throat. Projects and thematic units ideally should be initiated out of the team. If not, the other team members need to be thoroughly informed and allowed to critique and input at all levels of planning, implementation, and evaluation.

As the planning for the project started to take shape, it became apparent that the students were not being empowered enough to feel ownership. Our ideas had taken shape without student input and without a thorough evaluation of student needs. Perhaps it would be a few years before the student could see where the ideas fit into the whole project. The student at South is often not in attendance for all four years. The fact is that many students are not in attendance for five days of a week. This project would need to be broken down into individual units for our transient population, and those units needed to fit into the bigger project for those who were with us from start to finish.

Another obstacle that needed to be removed before the gift package could become a reality was the reorganization of an advisory board. With the continuing changes in the specialties, the advisory boards that had been strong and helpful in the past had deteriorated from lack of attention and focus. These shareholders needed to be supportive of our goals in order to assist with the necessary contacts and support a project of this magnitude would take to succeed. We needed to work on the development of a dynamic group from school, community, family, and industry to assist us.

Because the idea of AAI was overwhelming to most of the staff, it became apparent to those of us who conceived the idea that we needed to do something on a smaller scale first. It was from this sense of being overwhelmed that we developed a downsized project to use as a trial run in the hopes of convincing the team members of the validity of a project as a tool to teach AAI and to integrate academics within an area of the hospitality industry–food service.

How the Original Project Changed: The Cheesecake Project

Cheesecake production was not a new idea. We have sold cheesecakes to the staff the week before Spring break for several years. The students themselves like cheesecake; in Wisconsin, just about everybody likes cheesecake. In the past, the vocational teacher would make up a flyer and stuff the staff mailboxes. The students produced the product in one day; decorated and delivered the next. Any student selling a cheesecake received 50¢ in profit in their financial account to be spent at school. It was fun, it was successful as a fundraiser, and it taught the students how to make cheesecake. Although the gift package would be more comprehensive and global in nature, this cheesecake project was still a vehicle to teach AAI.

This year, during the opening comments to introduce the unit, we said, "This unit is not about learning how to make a cheesecake. This unit is about how to take a skill you learn and make an industry out of it." The cheesecake project was still teacher-driven, but now it was driven by all the teachers in the team. As a ninth-grade project, and one of their first fund-raising projects, the students lacked the awareness about planning such an endeavor. We believed that by our example of idea conception, production, organization, costing, and marketing that the students could begin to learn about AAI.

The team decided to begin by taking the students into our kitchens, in teams of four to five students, to produce the recipe for cheesecake. The recipe made three 8" cheesecakes, one for them to decorate and taste, one for them to use to analyze the appearance, and one to use for free samples in the teachers' lounges as a marketing tool. At the same time they tasted their product in Hospitality Management class, they studied descriptive words having to do with sight, smell, and taste in English class. They evaluated their cheesecakes and wrote sentences describing the appearance, aroma, taste, and texture.

The next step in the unit was for students to write announcements to sell the cheesecakes to the staff and students. The English teacher had a great time holding contests and voting on the best two or three. The winning students practiced and delivered the messages over the public address system. If you have ever tried to get a ninth grader to speak into a microphone, you know this is a major accomplishment. The students went on to write about the cheesecakes in flyers that were also voted on, printed, and stuffed in mailboxes. Verbal and written language development was an integral part of the English curriculum.

In order to set a price, the students needed to take apart the recipe ingredients one by one and cost them. There was considerable basic math involved in costing the ingredients. The students could visualize 16 ounce=one pound because they had used both ounce and pound scales during production. We started out with pencil and paper, progressed to calculators, and eventually set up a spreadsheet to adjust any changes that might take place. It was rewarding to me as a teacher when a student compared our product to a product she saw in the grocery store and suggested that we should decorate our cheesecakes with whip cream rosettes. This was a great lesson in researching the best whip cream to use, practicing the use of the pastry bag, and adding the cost to the product. Sometimes the students have the best ideas and the most energy to do them.

We designed the production line next. Since the students had made the recipe in their teams, they were familiar with the process. Now they needed to mass produce a standard product. Again, the teacher's expertise was used, but the students were asked to design the layout for a cheesecake factory as an assignment in class. The day of the production, each student was assigned his or her first or second choice of stations. We compared the differences between the "home style" baking in our teams and the industry-type production line.

Throughout the project, as we dug deeper into the aspects of the project, I was happy to get questions that I could only vaguely answer. We scheduled a speaker from "Suzy's Cheesecakes," a successful local company, to come and speak to us about the expenses involved other than the ingredients, as well as the history of the company, the marketing tactics, and the production aspects of their business. The students had their questions ready—they had been asking them since the first day the unit was introduced. As an evaluation of our project, the students compared their plan with the reality of a real industry—Suzy's Cheesecakes.

Next Year's Cheesecake Project

We all look forward to repeating the project next year. The geography teacher is planning lessons to include information about where the ingredients came from. The health teacher might examine the nutritional value and the health risks involved in the food product. English and math can further develop and fine tune their lessons. We could expand our product and do some comparisons to store-bought products. The use of the computer for every step of the unit will develop students' computer knowledge. When I look back at the success of this project, it is as important that the teachers feel good about it as it is for the students to feel success. Sometimes less is more!

As an assessment and a review tool, the team was anxious to move to a more student-driven project. We immediately began a new project that was brainstormed and selected by the students. This time we had the students analyze their production capabilities (what, where, how, when, for whom, and why) in relationship to each idea that they came up with. The students selected a submarine sandwich, marketed it with posters and announcements, and sold it to the student body before and after school. They costed the sandwich, and the vocational teacher demonstrated how to produce one sandwich. They developed and implemented several different production lines since we produced sandwiches for a week. The students chose to participate in a marketing, finance, or production team for this project. When the production was completed, the students assessed the skills they learned and used during the project and applied them to other areas of their lives. The students shared in decisionmaking about how to dispense their profits, which brought many interesting conversations and discussions about the human development aspect of industry: "Why should he get to spend the profits? He wasn't here." "I did all the work—why don't I get more?" "So and so stuck his fingers in the food!" It was rich material for the discussion of the "work ethic." The project helped teach AAI by practical application instead of by reading it out of a book, seeing a filmstrip, or lecturing. The students felt connected to the real world, and the teachers were rejuvenated. Sometimes less is more!

In this next section, we describe some important ideas that we realized, in hindsight, impeded our efforts. By discussing such factors as community, industry, school, faculty, and administrative support, we discovered why we needed to start out with a much smaller project.

Looking Backwards: Hindsight Conclusions

The team design of a project to promote Milwaukee and Wisconsin throughout the nation proved to be too large. Narrowing our focus to the hospitality industry in Milwaukee and the State of Wisconsin would still be too large for a first-year attempt. Instead of AAI curricular development, most of our time was spent trying to overcome the continuing objections expressed by the community, faculty, administration, and other critics. We considered the development of a series of scaled-down projects to acquaint the team members with the fundamental processes of AAI. And that is how the cheesecake project came out. We also learned a lot about our adversaries and supporters.

Adversaries and Supporters

The adversaries of the Hospitality Management program at South Division have been persistent in their opposition to this program since the program has been in existence. Usually, the criticism has been that the Hospitality Management program has only focused on the food service aspect of the industry, or it only emphasized the lower-level employment sectors of the industry. The critics have usually been wrong on this point. However, the siege mentality the team had to adopt to deal with these criticisms has led to some validity for this charge. The larger role of the food industry within the hospitality industry has never been fully explained to our critics. This is partly a result of not marketing the opportunities for advancement, the demands for increasing educational attainments, and the promotion of the ties to postsecondary education that existed in the program.

Community–Neighborhood

Other parts of the program had not been seen by the local community as being as subservient in their focus; travel and tourism, sports, parks, and recreation were seen as being more in line with upper-level management and entrepreneurial opportunities. This may be the result of the prominence of local, professional sports franchises. The Milwaukee Bucks (NBA); the Milwaukee Brewers (AL); and the Green Bay Packers (NFL), who play a portion of their home schedule in Milwaukee; and the minor league Milwaukee Admirals (IHL) have all had an impact on the daily lives of the region's citizens. The existence of Midwest Express Airline in Milwaukee as its hub has also played a part in this wider view that other aspects of the hospitality industry are more acceptable than food service.

Community–Parents

The school's local community has been critical of this program for years. However, the parents of students who enroll in the Hospitality Management program have been supportive of our efforts. What we need are more parents to voice their support of the program. The larger community has been more supportive of the efforts of the program. The members realize that the hospitality industry is a source of economic development—one of every seven jobs in the area is tied to the industry—and in the state of Wisconsin, tourism is the second largest industry. With all this, the hospitality industry would seem to be a natural focus for the development of a trained workforce based in the South Division community.

Industry–Advisory Board

We have formed an advisory board to help with this marketing problem. We hope to alleviate part of this marketing problem by our enlisting local hospitality industry representatives' assistance and participation by the Greater Milwaukee Convention and Visitors Bureau in promoting an improved image of our program in the community. Advisory board members from these groups are supportive of our efforts to overcome this opposition. As the service sector role in the community employment picture becomes more important, this support will enable us to provide a meaningful contribution to the area's continuing economic growth by providing capable, competent, and willing prospective employees for this or any other industry.

School–Faculty

The faculty opposition tends to come from a portion of the group that views vocational education as being in opposition to the development of postsecondary options for students. Some of the most vocal opponents charge that the time spent in the vocational aspects of the program is limiting to student opportunities in advanced courses, that is, Advanced Math, Speech, Advanced Placement and other higher-level classes. While this might seem to have some validity on the surface, it simply is not true for all students. The vocational specialty classes, while meeting for two periods, also allow for courses outside the vocational focus, and thus meet the needs of students wishing to take the higher-level classes. A part of the perceived problem is true: Sometimes the classes are only offered at the same time. This is usually due to limited enrollment in the courses, not because the vocational program teachers do not encourage their students to enroll in these classes.

When the faculty begins to understand that these school-to-work programs will provide greater options to all students, most of the opposition will evaporate.

The other problem with faculty support deals with integration of curriculum and the misguided notion that this somehow causes a loss of control over one's content. Nothing could be further from the truth. In reality, it enhances the content of the course by making the curriculum more meaningful to students. When students see a transfer of knowledge from one course to another, they become more involved in their studies. The subjects taught in an integrated course offering are constantly being reinforced by other members of the team.

Usually, when teachers finally try this method and understand how this makes their content more relevant, they become impressed with the results. For example, the social studies teacher, who was trying to make labor history relevant to most students, was having a hard time. The most common reaction to any history course is, "Why do we need this?" "When will I ever use it?" Well, with AAI, labor issues are relevant, including but not limited to contracts, health and safety issues, bargaining rights, government regulations, and a host of other topics. Or a geography teacher could involve cultural ideas, lifestyles, attractions, vacation planning, budgeting, and other ideas in the content of her or his instruction—all of which are relevant to parts of the tourism industry.

Teachers in other disciplines could find the crosscurricular ties equally impressive. Math and geography teachers could work together on common uses of time and distance problem-solving skills. Map skills development, such as the studying of latitude and longitude, are areas of possible connection. English or language arts letters could be used for information inquiries from other nations just as easily as they can be used for nonreal-world communications. Ties to vocational projects do not have to be mythical but could become real applications—for example, writing public address announcements and preparing flyers for sales of projects or information about activities is a real-world use of language.

There is another area where the conflict about the project could arise—that is in the participation of teachers who do not buy into the idea of integration. If all the members do not cooperate, the team idea is DEAD. Most teachers will try to improve their instruction, but some will not. Those teachers would be better in a non-integrated setting. Some are reluctant to change because they feel they are doing everything right as it is, some because they are afraid of change, and still others because they simply do not see change as being good. This leads to the next part of the problem. What to do about this reluctance?

School–Administration

The ideal situation would be for the local administration to take an active role in the process. This is not always possible. We are on the third new administrative team in our building in the last five years.

Every time administrators change, the philosophical focus of the school changes as well. Program support is in a state of flux almost yearly. It seems by the time an administrator understands the program focus, there is a new one to replace him or her. Stability would be a welcome relief for this program. Just about the time you get administrative allies, they leave—some by choice, some by reluctant transfer. Then the support building begins again. Leaving school in June with one set of expectations and returning in September to find another is never easy. Adapting to the changes is always time consuming; time that could and should be better spent on program improvement is instead expended on redoing the previous year's efforts.

Building the support of the community then starts anew. Each time the school changes, the opponents see a new chance to eliminate programs they do not support. Some conditional changes that occur at the switch of administrative teams occur in the areas of scheduling, finance and budget, duties, and other staff changes.

The scheduling that is set up under one team may or may not stay in place. Block time, if not understood by an incoming team, is usually among the first things to go. This leads to problems in flexibility of program design, common planning time, and program implementation.

The scheduling of team instruction outside of a block of periods causes a lack of coherence in instruction. Changes in personnel will cause the same kinds of results—personalities and interactions are important to the success of any program. Another important consideration to the effective implementation of this type of change is the necessity of leadership. Someone must be in charge and be given the responsibility to ensure that the program goes forward. When these changes occur, the program, no matter how well-intentioned or structured, will not succeed.

School–District

The matter of budget is another item of importance to the success of the plan. WITHOUT MONEY, nothing gets done. If you want a program to be a success, you must fund it adequately. Money for staff inservice, common planning, duty release, adequate instructional support, and materials must be included. The time for the program to work must also be included. No change will be successful overnight. If adequate time for program evaluation is allowed, success will not be achieved.

Factors Beyond our Control

Other considerations the team did not anticipate were those that involved the student population mobility, the changes that would occur within the school district, weather (as it related to shareholder meetings), union rules, and the day-to-day problems of teaching in an urban setting.

We at South Division have historically had a large student mobility rate. It is not uncommon for a quarter of the school population to move in a given school year. This is largely due to the type of economic area we are located in. It is a transitional neighborhood; it has new immigrants, working poor, shifting nationalities, and all the other problems of any urban area. The student population we teach has had a large dropout rate for many reasons—some for which we are given the blame and some for which we have no responsibility. The perception by some in the community is that we are not "culturally connected" to our students, whatever that implies.

It is hard to teach students that are not there, nor should we be expected to solve the gang and violence problems that exist in this area. We can and should provide some stability for our students; this means that, in the ideal situation, we should provide all parts of the AAI in all four years of the program. As mentioned, the program we anticipated would have been a comprehensive package to promote Milwaukee and Wisconsin throughout the nation and eventually globally; yet, when reality set in, we found that smaller is better. A few well-chosen projects would suffice to give our students an introduction to all parts of the AAI program.

For the students that stay with us for the full four-year program, the success rate is better than average for the school as a whole. (See the demographic data in the introduction.) We also have come to the realization that not all projects can or even must be taught by all members of the team. A common commitment must be included to teaching about all parts of AAI by all team members.

Union

The union contract gives little latitude in the assignment of teachers to schools in this district. There is a provision for making transfers, but the actual hiring of personnel is left to central administration. The transfer of teachers to open positions in the system is controlled by seniority, resulting in the senior person being selected for open positions even if he or she is not necessarily the best qualified person.

Other union considerations are in the areas of length of the school day, number of classes taught, requirements for prep and lunch, as well as planning time and compensation (once again, not all are roadblocks). There is a protection for teachers under this contract that we are not willing to surrender to arbitrary administrative decisions and tenure protection. There are those who would give these protections away; we, however, do NOT wish to dispose of them.

Despite these many barriers, we continue to move forward, redesigning our plan and working to better utilize AAI. As part of this project, we designed a wish list for what we hope our program will eventually look like. In this next section, we describe our dream program and what it would take to make this a reality, including the roles of students, parents, teachers, administration, advisory committees, and political interest groups.

Eden: An AAI Wish List

In Eden, hospitality is recognized as a valid curriculum. Our students are a heterogeneous group of students. We are able to work with students in the eighth grade to expose them to the many career choices they have. In Eden, our program is a six- to eight-year plan, which includes high school and postsecondary. In Eden, a major AAI project would be the gift package in its original form, spread out over all four years. In Eden, dilemmas would not exist.

Some of the items we would like in a perfect situation would include flexible scheduling, stable student populations, adequate funding, parent involvement, union and administrative support, more community action to promote the industry, and a greater commitment by postsecondary institutions toward furthering the vocational and educational goals and options of our students. Steps that could be undertaken at little or no risk would lead to better articulation agreements for the advanced standing of our graduates and wider use of partnerships (shadowing, mentoring, and job placement) to improve the status of the program.

The use of AAI to improve and expand the education of students is one that we would wish to encourage others to develop. This should not be limited to only our industry, but the goals and concepts should be industry-wide and applicable to any industry. Students should be encouraged to explore many career goals and options. They should not be limited in their examination of life, but encouraged to expand their horizons.

As mentioned earlier, the average person will change careers five or more times in her or his lifetime. It is incumbent upon us to assist students in making intelligent choices about these changes. If we do not, we have failed them.

When our team decided to incorporate AAI in South Division's curriculum, we felt it necessary to define shareholders and identify what roles they will play. In doing so, we defined shareholders as those associated directly with the educational process and those who represent the diverse segments of the hospitality industry. The segment of shareholders was complicated by the fact that we had to incorporate AAI into the three specialties that make up the SWIS program at South Division. The three specialties included parks and recreation, travel and tourism, and culinary arts. In looking at the cross sections of our shareholders, we have identified the shareholders as

- students and parents
- teachers

- high school and elementary educational systems
- post-high school alternatives—two- and four-year schools
- advisory committee members
- shareholders from the industry
- political interest groups: school system administration and teachers within the school; community members that influence the educational process within South Division

In Eden, the educational process can no longer center on the student alone; it must include parents. The level of academic success and technical skill mastery directly correlates to the anticipated successful careers parents desire for their children. If parents do not see their children committed to a career path which includes financial security and prestige, student ability to make meaningful career choices are jeopardized. This image seems to be a major difficulty in recruiting students at South Division High. But it also involves the active cooperation of teachers, administrators, and the community. Here we describe our ideal role for each:

Student and Parents

Parents of the Latino students have a very negative opinion of the hospitality industry. An image that is also shared by many African-American parents as well. They view the hospitality industry as a dead-end, low paying one with little prestige. The successful incorporation of AAI would be best served if included in a positive, up-beat recruitment program. This represents a major dilemma—how to recruit students for South Division's SWIS program that consisted of specialties in food service, travel and tourism, and parks and recreation. The recruitment program must clearly illustrate that low wages and working conditions may continue to exist for students who do not invest their future by obtaining postsecondary technical and academic education.

Students and parents must be empowered with the knowledge that excellent job security, good working conditions, and above-average wage benefit packages do exist for individuals with good academic levels and proven technical skills. Industry is simply in a position to demand employees who excel, not just "get by" as average. Our hospitality industry is no exception. The industry is poised to reward students who excel at the academic and the technical levels. It is this critical fact that students and parents alike must be educated. There are opportunities available for individuals to reach the upper levels within the hospitality industry.

The hospitality industry requires students to obtain bachelor's degrees, associate's degrees rich in technical skills, and meaningful work experiences in preparation for careers. It requires a cooperative effort of teachers and industry shareholders to empower students to make lifelong meaningful, first choice career decisions.

Teacher Roles

Teacher roles need to expand beyond facilitating the learning process. Teachers must fulfill students' needs by being excellent role models, by advising students honestly based on student abilities, and by maintaining articulation with postsecondary institutions. It is also important that vocational teachers maintain current technical skills. Students look to teachers for meaningful advice in their career choices.

Teachers must empower other teachers to incorporate AAI in their curriculum. Vocational teachers may find themselves assuming the leadership role in developing meaningful curriculum that affects students' educational outcomes. As is the case at South Division High School, the SWIS vocational instructors had to initiate AAI into their curriculum.

Administration

High school administrators, teacher staff, and so on, must promote a positive community image by providing a safe environment that allows students to excel in their academic endeavors. These elements certainly must be incorporated into an effective recruitment program.

The implementation of an effective recruitment program requires the understanding of where the student population comes from. We recently have been involved with several career programs at the middle school level, which we feel, at the technical level, is fertile grounds for recruitment. We are also encouraged by South Division's administration in providing SWIS teachers to present at career days in the middle schools. Thus, student populations at South Division's SWIS program are more likely to be there because they want to be, not programmed into the hospitality curriculum by the guidance counselor.

Another effective recruitment strategy may include a shadowing at the middle school level. We need to allow students to participate in the implementation of the hospitality curriculum at South Division. This certainly would give middle school children an opportunity to investigate a career option.

Post-High School Alternatives

High schools and postsecondary institutions must articulate to develop meaningful curriculum that encourages students to fully participate, not just occupy desks or a lab station.

Postsecondary institutions must be the link between industry and students who have chosen the hospitality industry for their careers. Four-year schools and technical schools must provide the training that meets current industry standards. They must offer curriculum that prepares students to meet the global challenges of the hospitality industry. We feel that the incorporation of AAI will broaden the horizons of young professionals.

AAI can be taught to meet general, everyday lifestyles or can be industry-specific. Whatever the strategy, high school and postsecondary curriculum must meet student needs. Postsecondary options must be diversified and flexible to meet the varied population.

Advisory Committee Members: Shareholders from the Industry

One area SWIS needs to improve is the makeup, formation, and function of the advisory committee. The makeup, if possible, should consist of highly respected individuals who possess political and industrial clout. Unfortunately, education has become far too political, with instruction and quality in education being the loser. However, in making progressive change, we need to empower allies at all levels. Political clout is beneficial, as are individuals who represent influential companies in decision making. Individuals representing leaders in the industry are beneficial to us because they usually speak on behalf of highly professional organizations that invest in quality, professionally trained employees—the very commodity education represents.

It is this type of influential shareholder that can empower others to get involved with educational reform. Third party shareholders are often the result of advisory committee representation coming from professional industry representatives. Committee members from state restaurant associations, tourism and travel, club manager associations, and dietary manager associations would be excellent choices.

The list would certainly not exclude individual representatives from business and industry. While it is important to be selective in the specific industry representation, one must be equally considerate of the individual spokespersons. There is no substitute for a highly respected professional individual. We think the best advisory committee members are highly committed and motivated. They are good listeners, and when they speak, everyone else listens to what is said.

In South Division High School's situation, the following advisory committee makeup should seriously be considered:

- Programs' core faculty solicit the best five to seven members for each specialty area for individual advisory committees.
- From the individual committees, two to three members would make up the department's advisory committee.

This two-tiered advisory committee system would create small, efficient decisionmaking processes, with major issues making up the agenda at the departmental level.

The equal representation at the subcommittee level would give equal representation, thus not promoting one specialty over another. Problems and change can be zeroed in on with subcommittees. The large, undefined advisory committees are often inefficient, get bogged down in decisionmaking, and are often overpowered by outspoken interest groups. The number and the makeup of the advisory committee can be a disadvantage.

Subcommittees and the departmental advisory committee need to meet regularly with a well-defined agenda and some anticipated outcomes. The advisory committee must be held together to be effective. The ideal situation would be a subcommittee meeting held in the fall with the departmental advisory committee scheduled for the spring. Also, chairpersons for the committee should empower the committee to have a dual purpose: (1) to service the needs of updating the curriculum and (2) to incorporate shareholders' agendas.

To be effective, the advisory committees should have a specific charge as to their function as a committee. One of the most important charges for an advisory committee is to validate present curriculum and endorse changes. Thus, one of the first orders of business our team performed was to reestablish the dormant advisory committee.

The purpose of mobilizing the committee was to obtain its input as to the validity of AAI, and to empower faculty and administration. The advisory committee unanimously endorsed the incorporation of AAI into South Division's curriculum. We hope its resounding support of AAI sends a clear-cut statement to administration and academic teachers at South Division.

Political Interest Groups

We also hoped that the nucleus of advisory committee members will empower other shareholders in industry to become active in the educational process and as future employees. The advisory committee members hopefully will influence the negative political and community opinion.

While your advisory committee should predominantly be made up of advocates of a program, we feel it is necessary to invite adversaries to participate as advisory committee members as well. By including adversaries of the committee, we will greatly improve the quality of decisionmaking at the advisory committee level. The positive and negative interaction of the advisory committee should greatly reduce the influence of adversaries. The end result: A meaningful solution to educational reform or the update of curriculum.

The interaction of industry shareholders and faculty encourages faculty to remain active and current with industry. We have investigated the multiple roles various shareholders in industry may fulfill. Naturally, shareholders from industry are prime candidates as advisory committee members. But they wear two hats: (1) shareholders are instrumental in educational reform, and (2) they are the future employers. It can be easily said that their input and role are invaluable to the success of high school and technical curriculum. Their input oftentime assesses the outcome of academic change.

Shareholders from industry also provide meaningful communication between industry's professional organization. The communication between industry shareholders and educational entities is best served by maintaining an active advisory committee. Guest speakers from industry, industry tours, and on-site shadowing are valuable articulations.

What Our Dilemmas Have Taught Us

In this last section we conclude with a description of our most salient lessons. If one is to embark upon a project like this, one may expect to encounter several dilemmas. We hope our lessons—ranging from resistance, to lack of time and support, to disinterest—are helpful to you.

Plan to meet with people who are reluctant to change. Some of our solutions to this dilemma were to have open lines of communication with students, teachers, parents, administrators, and industry. Second, it is important to market a program. Although as teachers we are often too busy doing what we are doing to take time out and toot our horns, it is crucial that we do so. People need to be sold on the benefits of a program. An active and involved advisory committee is a wonderful asset to the program. But faculty must also be empowered to take ownership of decisions. In addition, it is also important to keep staff members up-to-date, as many may have little understanding of the program. It is important to take time to inservice all teachers on program goals and processes. And, finally, one of the hardest things is to get the support of your administration—especially when the administration has a high turnover rate.

The next dilemma is lack of time. In order for a program to be successful, there must be a time commitment from the administration and the faculty. Administration must provide time for common planning and flexible scheduling, while the team must be committed to possibly working above and beyond what is required in a school day. Common planning, which is a key ingredient to success, is better held in the morning instead of at the end of the day. End-of-the-day planning gets bogged down with discussion of students, problems, and so on, while planning at the beginning of the day allows for a more positive focused discussion. There must be an agenda to planning meetings, and someone has to take the leadership role.

Another major dilemma for us has been the poor perception of our industry by the general public. Again, marketing, advisory committees, and use of positive media such as town meetings to inform and empower, are ways to deal with this dilemma. Politics, when infused into the school environment, are sometimes self-serving. Again, marketing—having an active advisory board and active industry leaders—can help. Also, a follow-up of graduates and employment statistics can be a real boost for the program.

Another dilemma is that we only have our students for such a short time period. Ideally, a relationship could begin at middle school through speakers, shadowing, and recruitment, and should continue beyond high school into postsecondary. Articulation agreements with postsecondary institutions allow for an easy transition from our program to students' next steps.

Another concern is that everyone wants change, and they want it yesterday. People need to be aware that an ongoing evaluation of progress is needed. Alternative methods of assessment such as employee portfolios, practical application, and authentic assessment rather than instructional testing, are all better indicators of success.

And finally, our last dilemma is about motivating students and making lifelong learning applicable. We know many of our old methods do not work with this MTV generation. First, students must have input into what programs they sign up for; we need to allow students to design some of their projects and curriculum. The students are our customers; we need to survey them, address their concerns, and build on the positives. Hands-on student-driven projects allow students to be empowered. Students influence other students, and by getting leaders and other students interested we can become a positive force in the school.

This is our story. We hope it is helpful to you.

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PENNSYLVANIA YOUTH APPRENTICESHIP PROGRAM

Abstract

This case study is not set at one particular school. Rather, it involves four individuals in four different schools united by an interest in apprenticeship programs. This case study starts with an overview of how the Pennsylvania Youth Apprenticeship Program encourages teachers to use creative methods to develop multidisciplinary projects. The team then focuses specifically on a particular project (The Bridge Project) that it developed as a means of developing an understanding of teaching and assessing the concepts of All Aspects of Industry. The case study reviews the thought processes that went into the development of the project and assesses some of the key elements necessary to designing and implementing such a project. It gives examples of some of the resources needed to complete it and provides a scoring rubric for assessing students' understanding of AAI.

PENNSYLVANIA YOUTH APPRENTICESHIP PROGRAM

by Diane Coumos, Margaret Holder, Martin Nahemow (LDRC),
David Pacolay, and Jean Simcic

Introduction

This case study starts in the late 1980s when a study team was formed to assess the need for a new school-to-work concept in Pennsylvania. In August of 1991, their recommendations led to a team of teachers being brought together in Pittsburgh to create a curriculum for a new school-to-work program (later called the Pennsylvania Youth Apprenticeship Program [PYAP]) and to help train other teachers to use it. The curriculum that the team developed, and which is now used in 26 school districts across Pennsylvania, is called Integrating Academics and the World of Work. As this case study unfolds and describes the development of our original concept, the curriculum, and the formation of our development team for the PYAP, it will become clear that AAI, while not explicitly identified, was woven implicitly into the PYAP from the beginning.

In the fall of 1993, three of our original five member teacher team—Maggie Holder, Dave Pacolay, and Jean Simcic—and the guidance counselor for the PYAP at Peabody High School, Diane Coumos, were given the task to revisit the curriculum from the particular focus of All Aspects of the Industry (AAI). The core of this case study focuses on our discussion of implementation of AAI into PYAP. During the 1993-1994 school year, members of our Pittsburgh team worked with the local PYAP stakeholders and rethought the student competencies for the Youth Apprentice in the language of AAI. (Samples of stakeholder documents that illustrate the development of the stakeholder group, the specific competencies, as well as specify some of the challenges presented to the program and the stakeholders' reactions to the challenges appear in "History of Curriculum Development" in the Pennsylvania Youth Apprenticeship Program section of the Supporting Materials.) We then developed a project, "Bridge to Learning," after analyzing AAI as the assessment criteria for student projects. Materials related to this project are located in the Supporting Materials under the Pennsylvania Youth Apprenticeship Program section—the Bridge Project. In this project, teams of students formed companies to research the need for, implement the development of, and build a model of a bridge to fill a real community need within a budget; meet local, state, and federal regulations; and develop skills based on AAI.

History of Curriculum Development

In the spring and summer of 1991 we created the conceptual framework of the PYAP. We framed this multidisciplinary curriculum to address and support an integrated blending of work-based and academic instruction. We knew that the success of this new initiative rested on the credibility of the curriculum developers in the eyes of other classroom teachers who would have to implement it. With this in mind, Learning, Research and Development Corporation (LDRC) recruited our Master Teacher Team of five teachers: Maggie Holder, Elizabeth Forward High School, English/Spanish; Ronnie Izenson, Peabody High School (Pittsburgh), Social Studies; Dave Pacolay, ATCD Student Placement (Pittsburgh), Coop/Vocational Education; Glenn Reis, A. W. Beattie AVTS, Machine Shop/Math; Jean Simcic, Schenley High Teachers Center (Pittsburgh), Science/Math.

As a team, we first had to develop an understanding of the worksite. We made many visits to worksites, and we conducted interviews with employees about work, education, training, and opportunity in order to relate instruction in context and connect school and work. The writing of a multidisciplinary curriculum also required that we develop collaboratively beyond the content and structure of the program. The multidisciplinary curriculum was to be a new paradigm. Thus, we found that we would also have to deal with how other teachers would function under this new paradigm. Functioning as a self-directed team through the 1991-1992 school year, we worked to create a curriculum with sufficient work-based projects for the first year.

Teachers from the six pilot sites were introduced to our curriculum in the summer of 1992 at a workshop conducted at Shippensburg University in Pennsylvania. During the 1992-1993 school year, we continued to work every afternoon at LRDC and produced the curriculum for the senior year of the program. At the annual Pennsylvania Department of Education Training Workshops at Shippensburg University in July of 1993, the senior-year curriculum was introduced for the first time to the six pilot teaching teams. At the same workshop, teaching teams from ten new sites were introduced to the curriculum. In 1994, teaching teams from ten more school districts were trained in "Integrating Academics and the World of Work." Teaching teams throughout the state continue to meet four times during each school year in Harrisburg to share ideas and collaborate.

The following are excerpts from the philosophy section of the PYAP curriculum, as well as the course descriptions and the introduction to the project section. It is easy to see how AAI ideas are embedded within the initial PYAP curriculum. For example, from the beginning, one of PYAP's goals was to help students learn about the many different aspects of the industry in which they worked. Interviews with workers in other departments, company owners, supervisors, and so on, are encouraged and even required by some projects. The PYAP "product" is a smart worker who is flexible, learns well, and understands the industry in which he or she works. The general curriculum description and excerpts (described below) illustrate the flexibility allowed by the curriculum. Later in the case study, we will feature one particular project, "A Bridge to Learning Project," which grew directly out of the introduction of AAI to our team. It is also a perfect example of how a teaching team can blossom an idea into an interdisciplinary experience whereby students can learn with an AAI focus. Key features of our curriculum are as follows.

Team Teaching

The structure of the PYAP fosters a total learning experience which allows the student the opportunity for exploration, response, and a sense of control and ownership of what they learn.

Preparing students for a school-to-work transition requires that school learning is connected to the world of work. Our writing team included English, mathematics, science, social studies, and coop/vocational education teachers. As a team, we first had to learn how to interact in a multidisciplinary learning environment in order to develop a curriculum based on work experiences and collaborative teaching of the embedded academic principles. Only when we could shed our own old paradigms of learning could we create new paradigms of integrated learning in the world of work.

The curriculum encourages PYAP students and teachers to spend a large block of time together. We used the time flexibly to introduce projects, discussions, and assignments, and to respond to the needs of students and employers. All teachers were to have common planning times in order to collaboratively develop and plan activities and lessons which would allow flexibility, initiative, and discovery. Unfortunately, in the 27 school districts in Pennsylvania now using this model, few have come close to the ideal of block programming and common planning time.

Portfolio Assessment

PYAP is dedicated to preparing students for success. Since we learn better, faster, and retain more knowledge when taught in context, PYAP provides an environment in which work acts as an introduction to discovering the academic principles needed to be vocationally and socially secure. The portfolio is the bond which connects all experiences from school and work so that the students can recognize, appreciate, improve, and reflect upon them. The PYAP portfolio demonstrates to the students that they have substantial, meaningful records of their achievement which are recognized by all involved in the experience.

The portfolio is the vehicle which permits the student to produce, conceptualize, and reflect as he or she proceed through the PYAP experience. Entries can represent examples of the student's work, whether academic or work assignments. The students, teachers, and employers agree as to what is acceptable to place in the portfolio, notebook, or file. The criteria for what is acceptable come from locally determined transitional outcomes which are developed in conjunction with the regional stakeholders.

The work submitted contains demonstrations of competencies normally associated with academic proficiency and thus satisfy local and state school district requirements. The portfolio also reflects the student's achievement of agreed-upon outcomes. The outcomes are aligned with the outcomes specified by the Board of Education of the State of Pennsylvania. Demonstrations of work competency reflect recognized professional and industrial standards or employer satisfaction. The coop teacher assists students in maintaining the documentation. The entries include academic and work assignments, certifications, awards, and so on. The teaching team members review all of the students' work and accept for credit those achievements demonstrated in areas outside their own. Certain assignments contain components which can be interpreted and assessed by more than one or all of the disciplines. Unlike traditional curriculum approaches, this curriculum is a dynamic entity. Teaching teams feel free to adapt and change the curriculum to fit their needs.

Junior Year Introduction

Not only are block programming and common planning time important to the goals of this curriculum, the ownership of space within the school building by the students and teachers is needed for the effective integration of academics and the development of projects. The start of the school year sets the tone; projects are neither familiar nor obvious to students or teachers. Our team has learned to structure the first days of the school year around activities which would provide its students with a familiarity and comfort with the following ideas:

- What should I expect from my first day on the job?
- What will be my employer's expectation of me?
- Why must I think about safety?
- What are the dangers at work?
- How can I study effectively?
- What is research?
- Where do I find information?
- What is a journal, and why would I want one?
- How do I keep a journal?
- What is a portfolio, and why do I need one?
- Whose portfolio is it?
- What is a project, and who assigns it?
- Where do project ideas come from?
- If I work in a team, who gets credit?

The junior-year curriculum is meant to be a transition from traditional to project-based and integrated teaching. It is divided into a set of Focus Projects which encourage teamwork and integration, and core subject areas, which provide a comfort zone for subject teachers. The core subject areas are sufficiently flexible to allow increased integration as the school year progresses. To strengthen the link between school and work, the Workplace-Issue Focus Projects address four major concerns of employers. The projects are meant to be concurrent with the curriculum, where the blending of the disciplines and the link to work become most obvious. The following are the courses intended to support the first year of the program:

Focus Project: Workplace Issues

The focus projects offer flexibility to teachers and students to incorporate the disciplines of English, social studies, science, mathematics, and technology. We think an appropriate project can be conducted during a nine-week grading period. It is also important that the student introduction to the projects be a team effort. The projects provide ample opportunity for self-discovery and self-direction. As teachers, we act as resources and guides, directing student discussion and eliciting student input to determine the direction the project will take. Project examples include "Why Is Work Important?" "Why Is Safety Important?" and "Getting Along at Work."

Core Subject Areas

1. *The Literate Worker*

   This course is designed to be as flexible as possible. Although it incorporates a survey of American literature, along with work-related writing assignments, no specific eleventh-grade anthology is required. Therefore, the English teacher may use an available anthology and supplemental texts to design the appropriate reading components at a minimal cost to the school. If texts are purchased, *The Norton Introduction to Literature* contains sufficient material, is flexible, and could be used for the senior year as well.

   Readings should range from Puritan to contemporary works, include all genres, and be chosen with the theme of work in mind. Suggested readings which follow each unit are commonly found in secondary anthologies and illustrate the work theme. The units are arranged by genre, and can, therefore, be thematic, but it would certainly be possible to combine approaches and teach a period through a genre.

2. *Social Studies in the World of Work*

   In addition to helping students develop an appropriate level of understanding, the curriculum must also meet their needs at the workplace. To facilitate this, the curriculum is as flexible as possible. Topics in American history have been chosen to enable the student to become familiar with major themes and persons of importance. Each topic has suggestions for activities that will give the students practice with skills that are pertinent to their employment such as the ability to communicate information; ask for assistance; follow directions; take constructive criticism, which may include negative feedback; retrieve information; deal with problems such as an angry coworker; and recognize the feelings of others. These suggestions should not limit the range of possibilities for the teacher nor the students, for much of what transpires in the classroom and is discussed in *The Craft Apprentice* relates to work experiences; thus, there is ample opportunity for structuring activities around them.

3. *Forces at Work*

   This course is intended to provide a solid foundation in mathematics and physics and their use as problem-solving tools. The curriculum stresses the balance between a solid, traditional understanding of the concepts of physics, trigonometry, and algebra, as well as the need to be able to apply them in realistic problems. The very nature of work-based learning provides a transitional base necessary for applying mathematical and scientific procedures in a practical context. The principles taught in this course are investigated and applied in the actual performance of work-related tasks. The Forces at Work course provides students with the opportunity to investigate and learn traditional math and physics concepts in a new way. Through a series of activities, students design, build, and operate devices that encourage further investigations. For example, students predict and describe the cause and effect of motion by observing the behavior of self-made vehicles as well as machinery at work. Students have the opportunity to apply math skills and conceptualize science in the work environment through hands-on experience.

The above components comprise the explicit curriculum—the tool that allows the development of project-based and integrated teaching and learning. Implicit in the PYAP students' experiences is the synergism between issues which arise in the workplace and the core curriculum material.

One of the tools that facilitates this synergism is the journal kept by each student. These journals are also an integral part of the core curriculum. In this original curriculum, the ideas of AAI were implied by the manner in which the relationship between school and work was structured. A more formal or explicit set of definitions and descriptions of AAI now provides the students and teachers with scaffolding to support a more meaningful development and understanding of the relationships between school and the work experience.

The AAI Project

After creating the initial PYAP curriculum, as described above, we became part of the AAI project. We reflected about our previous work and then developed the Bridge for Learning Project. In doing so, we realized that many long-time practices—teacher planning for student learning that incorporates experience along with information—required a shift in thinking. For many years, our plans centered around what information we would present to students and when we would "present" them with a test. A major shift occurred some years back when teachers were told that what we did was less important than the behavior that was observed on the part of students, and thus were born "behavioral objectives." Whether the philosophy attached to behavioral objectives was embraced or rejected by teachers on an internal level, our lesson plans began to look different, and thus we began the long trek away from the teacher-centered classroom.

Now, we had to take this process some steps further. Because employers are no longer in need of employees who can merely follow step-by-step instructions, or take their places along an assembly line, we can no longer educate students with a system that was designed to produce factory workers. The need for employees who can adapt and understand all aspects of the industry in which they are involved, whether it be manufacturing or medicine, publishing or public safety, is critical.

One way to produce such employees may be through experiential project-based learning such as that which we developed for PYAP. Many programs throughout the country are experiencing success by combining project-based group learning with an apprenticeship. The PYAP is a partnership of, and has been developed by, government officials, local business leaders, educators, parents, and community leaders. In reflecting about our progress, we realized that, in many ways, it is an answer to a crucial state and national need for self-directed workers who are team players, who have the knowledge and motivation to learn and continue learning throughout their lives. In such a program, school and work go together. The integrated high school course is centered on the work-related projects and traditional academic disciplines necessary to help students become smart workers. Technology courses are coordinated with a work setting component designed by a school-to-work facilitator and a worksite mentor.

Since its inception, PYAP has evolved and is structured differently at each site, depending on staffing restrictions and local needs. For example, the Peabody site has a team of academic teachers who work together with the school-to-work facilitator to blend academics and address worksite issues in the classroom. Their teaching assignments also include traditionally scheduled classes in addition to their work with PYAP. Assignments may contain components which can be interpreted and assessed by all disciplines, including the facilitator, worksite mentor, and employers. Unlike traditional curricular approaches, an additional emphasis is based on the assumption that the curriculum is a continuously evolving entity; the teaching team feels free to adapt and change to fit its needs and those of its students.

Writing a curriculum to support PYAP required not only a shift in our thinking but a completely different approach to learning. It also required the formation of a team which had to learn to discuss, disagree, brainstorm, and reach consensus with minimal violence! Coincidentally, this is exactly what employers say they need in their employees, and something teachers are ill-equipped to do, owing to the isolation built into current school structures. This curriculum team worked for two years to develop a curriculum for use in PYAP sites. The work included about forty visits to workplaces in order to help us learn about the industries in which PYAP students would be involved. The curriculum is used merely as a guide, allowing teams to adapt to local needs.

In thinking about AAI we realized the most basic element to planning a project that incorporated these aspects of industry was shifting from just presenting information to targeting a "product." What will the students produce? Along with the project, we must develop the criteria by which the product will be judged. Instead of a traditional mindset in which assessment is the last step, planning must begin with the assessment and work backwards. As in industry, standards must be set, as well as a plan for dealing with products that do not meet the standards.

At least as important as the product, however, is the answer to the question, "Why?" Every teacher has been treated to the inquiry, "Why do we have to do this?" And while it may be delivered in a whine that provokes an instinctive "Because I said so," it is a legitimate question. The product should have a real-life quality about it; students should be able to see a connection between the project and their work and to appreciate the efforts of their work. The multidisciplinary team approach, as well as the work component, helped us to answer this question.

Flexibility is the other key element. Most teachers overplan, a result of years of habit. Project learning not only takes away the burden of being the major resource in the classroom, it also allows plans to develop even as they are being implemented. Variations may occur as students begin their projects, and some means must be incorporated to deal with these changes. Some of the best projects begin with the question posed to students, "What are some ways that you can prove to me that you know this?"

One of the hardest changes to incorporate is the involvement of students in planning. Teacher guidance is critical, but student input is also necessary. At the least, discussion must occur which allows students to analyze their own suggestions. A method we found useful when writing for PYAP was to hang up a paper which contains the goal of the project and use it to refocus discussions when necessary.

The Bridge to Learning Project

During the AAI project, the science teacher at the Peabody site suggested a Bridge Project, which although it contained some of the intent of AAI, did not provide the type of full engagement of all the disciplines we were attempting to address in PYAP. As we reviewed the AAI documents and set ourselves to the task of writing the case study, we realized that AAI actually synthesized much of what we were trying to accomplish in PYAP but had never been articulated in that way.

We realized that teaching AAI was actually the goal of programs such as PYAP, and that the most effective way to incorporate AAI into the program was as an assessment vehicle. We developed an assessment rubric based on AAI and intended to use it for assessing any senior work-based project. When we completed the rubric, we realized that it was not only applicable to Senior Projects, but to any work-based project. Our confidence in what we had developed was validated when it was used by the teachers at Peabody. They were in the process of developing a Bridge Project, and when presented with our AAI rubric, they accepted its value and incorporated it into their planning. Using the AAI-based rubric allowed the teachers to see clearly how the diverse components of the project tied together. The AAI framework changed the project from a loosely connected set of tasks to a single, integrated project driven by AAI and the student outcomes. (See "The AAI Project" in the Pennsylvania Youth Apprenticeship Program section of the Supporting Materials.)

The Bridge Project itself started out with a simple science-/math-based project in which teams of students are tasked to build a bridge that holds the maximum amount of weight possible. Classroom teachers using the project model usually specify the materials to be used, the amount of material permissible, and hold a competition upon the completion of the bridges.

The PYAP brought in AAI to the Bridge Project by assigning the students to teams and defining roles for them, for example, engineer, accountant, foreman, and so on (See "The Bridge Project" in the Pennsylvania Youth Apprenticeship Program section of the Supporting Materials). The students were taken on a field trip to observe bridge design around Pittsburgh. (Pittsburgh's rivers and topography made this facet particularly easy: we boast more than 750 bridges within Allegheny County of many different styles and designs.) This was also an opportunity to teach some local history concerning our rivers and bridges, and the role they played in industry and the community.

Student teams researched all the steps necessary in planning the building of a bridge, including environmental impact, community relations, and budgeting; they also were required to complete facsimiles of forms submitted to nine government agencies during this process:

1. U.S. Army Corps of Engineers – Permit Program

2. Section 10: River and Harbor Act – 1899, section 404: Clean Water Act – 1977; Revised 1992 – Transportation Project: Application

3. Chapter 105 DER Regulatory Permit Application

4. Fish & Wildlife Service (Department of Interior)
   Environmental Review – Impact Statement

5. Environmental Protection Agency
   NEPA Environmental Clearance Application
   Section 309 – Clean Air Act

6. U.S. Coast Guard: Transportation Project Application

7. Pennsylvania Fish and Boat Commission Review Statement

8. Pennsylvania Historic Museum Commission – Section 106 – the National Historic Preservation Act – 1966 Verification Application

9. Pennsylvania Department of Transportation Route Approval Application

The appropriate forms and agencies used depended on the project and location. Teams were then required to develop a budget for the project and complete the project within the budget, or suffer the appropriate consequences.

English skills were necessary in all of the communication portions of the project itself, as well as the interpersonal skills necessary for functioning as a team. The importance of the aesthetics involved in bridge design was also a natural opening for a discussion of the symbolic meaning of bridges, as well as the introduction of literature which dealt with bridges as a topic or theme. The students also produced concrete poems (shape poems) which they read at their portfolio presentations.

We found that the concept was as expandable as we wished to make it and saw that it could easily be turned into a long-term project in which students could develop skills in a variety of areas. This was also viewed by some of the teachers as a negative, since closure was expected according to a schedule, and time constraints were a problem, as is always true in schools. With AAI as the driving force, project learning was used to help students learn skills which were both in demand by employers and transferable to many different jobs and industries.

A committee of stakeholders, including educators, business, industry, and community representatives conducted the actual assessment of the Bridge Project. They based their assessment on guidelines which had been developed and agreed to by students and the teaching team in accordance with AAI guidelines and student outcomes.

Following this project, we created a general guide to designing such projects.

Designing Student-Centered Projects To Incorporate AAI

- *Decide on a Learning Goal.*
  Many teachers feel trapped by a curriculum and feel there is not enough time for projects. This was especially a problem in PYAP, since teachers and students only meet three days a week. Therefore, well-planned integrated projects became a necessity. A project learning goal may include one or more objectives in a curriculum. Using the AAI and Student Outcome Statements helped the Peabody team to launch a project on bridges. Some learning goals met within this project included designing, building, and testing a bridge that would hold a specified amount of weight. To reach this goal, students completed tasks which can be identified within the AAI guidelines. (See Rubric in "The AAI Project" section of the Pennsylvania Youth Apprenticeship Program in the Supporting Materials.)

- *Define a Product To Manufacture that Incorporates this Goal.*
  The product is merely the item that demonstrates that learning has taken place. It may be a physical object, a report, a poster, and so on. Students should be included in the decisions leading to the goal and the product so that they may feel ownership of the project as well as the process. This aspect of the Bridge Project gave renewed vigor to the students and teachers at Peabody. A product was developed and built by four teams of students. Positions assigned within the teams included engineer, draftsperson, accountant, supply clerk, carpenter/builder, and lawyer. Tasks assigned to each were identified and modified as needed.

- *Investigate the Background Information with a Participatory Process.*
  Students should investigate on their own as much as possible. Their appetites can be whetted with just enough information to make them want to seek out more. By investigating, rather than taking notes from lecture, they learn how to learn. Background for the Bridge Project was obtained through several field trips and self-conducted research gatherings. Historical facts about the bridges surrounding Pittsburgh were supplemented by observations and details that gave each bridge its own identity. Students investigated the role of the Department of Highways, the Department of Environmental Resources, the Fish and Game Commission, OSHA, various unions, as well as the concepts of right of way, eminent domain, aesthetics, and the securing of all necessary permits.

- *Set a (Flexible) Time Line, but Ensure Closure.*
  Students and teachers must learn to plan and budget time. In the Bridge Project, the teaching team tried to rely as much as possible on methods which would eliminate unexpected occurrences. Because the plan included fines for not meeting deadlines, students realized early that they must work faster than they were accustomed to and had to be more involved in the project to avoid shoddy work and the consequences attached. On each team, an individual is assigned to monitor progress and adjust team assignments as necessary.

- *Have a Method To Gather Feedback and Monitor Progress.*
  Short meetings with students, supported by their journals, may be necessary to monitor progress and solve problems. Make sure that it is clear among the students whose responsibility it is to report problems. During the Bridge Project, Peabody teachers met twice a week (and more when necessary). At times, it became necessary to redefine roles or duties.

- *Develop an Assessment Rubric.*
  Assessment should include a clearly defined rubric. The rubric should be made available to the students as early in the project as possible. This can serve as a guide throughout the project. Assessment may include traditional means such as tests and quizzes, but should provide choices in how students can demonstrate mastery or competency. The Peabody teachers used a combination of the AAI Assessment Routine and Student Outcome Statements. (See "The AAI Project" in

the Pennsylvania Youth Apprenticeship Program section of the Supporting Materials.)

- *Involve Others in the Evaluation Process.*
  Student attitudes can change when they realize that their work is going to be evaluated by someone outside their classroom. At Peabody, employers, stakeholders, administrators, educators, and others are involved throughout the year in all aspects of the evaluation process, not just in specific projects.

- *Provide a Means for Students To Reflect and Self-Evaluate.*
  Because students were introduced to the AAI Assessment Routine and the Student Outcome Statements, they can identify what is expected of them and what they must be able to demonstrate. They maintain documentation of what they can do in their individual portfolios. From this documentation, teachers can produce individual career education plans for students. Videotaping the presentations is also an excellent means for self-evaluation, which must be part of the assessment routine.

Because time can neither be created nor destroyed, all of these efforts must take place within a restructured setting. Teachers and students need to be able to move freely between the classroom and the workplace. Teachers must also be trained to be flexible and willing to constantly reset limits on projects, grades, and so on. If an opportunity arises to take advantage of a worksite situation by having students remain at work for more than their "allotted" time, or if a class project needs more time, the flexibility to accomplish this must be built in.

This kind of flexibility makes the concept of block scheduling obsolete and removes labels from learning. Teachers often fear a loss of control when the labels are gone, but what actually happens is that they then become the most important resource for learning. They become the means by which students learn to learn—the most important skill on any job.

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AFTERWORD: LEARNING FROM EXPERIENCE: ADVICE FROM COMPLEMENTARY REFORMS

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Introduction

While the schools portrayed in the previous case studies learned to redesign their programs around all aspects of the industry, common implementation issues arose. Certain features of redesign proved particularly complex such as creating and sustaining schools-within-schools, integrating curriculum across multiple disciplines, or linking student work and community-based experiences with school-based curriculum. We realized that these dilemmas and implementation issues were in many ways parallel to those experienced by teachers involved in complementary reforms around the country.

We decided to take a look at schools involved with the Coalition of Essential Schools, the Center for Collaborative Education, the Philadelphia Schools Collaborative, Service Learning Programs, Foxfire, REAL Enterprises, and City/Community-as-School. (Detailed descriptions of these efforts appear in As Teachers Tell It: Implementing All Aspects of the Industry: Supporting Materials [MDS-885b].) While each of these efforts are distinct, we knew that they were beginning to converge around common ideas and processes—ideas that were also common to our teachers restructuring around AAI. In particular, they all

- emphasize *student ownership* over their education through involvement in curriculum development and through ample *student choice*.
- make students take *responsibility* within and for their education.
- appeal to *students' interests* through subject matter and theme.
- develop *structured pathways* from high school through post-high school—for example, Tech Prep and work-based learning—so that students see the relevancy of the skills which they are developing.
- use *experiential learning* methods—for example, project-based learning and field-based learning.

- create *individualized learning experiences* to address the individual learning styles and needs of students.
- create and foster *communities* of which students and staff can identify and feel a distinct part.

Thus, they agree about the pedagogy of instruction—or how and where students are taught and the roles played by teachers and students. Although they articulate it in different ways, they seem to agree about creating student experiences that are real and grounded in the community or workplace. Structural commonalties follow as many advocate the creation of smaller, and thus more personal learning communities. Because of these similarities, we felt that learning from teachers engaged in these efforts would be especially helpful to the teachers involved in AAI study. They differed in one key way, however. Few of the above stated reforms share an interest in interdisciplinary curriculum developed around an industry theme. Thus, they differ on the content and focus of interdisciplinary efforts. Despite this distinction, we decided to spend some time learning from them about implementation.

After reading about the Coalition of Essential Schools, the Center for Collaborative Education, the Philadelphia Schools Collaborative, Service Learning Programs, Foxfire, REAL Enterprises, and City/Community-as-School, we identified schools which had worked with them in some way or another. We then spoke with members of the staff during site visits and over the telephone about some of their successes and stumbling blocks in restructuring. The set of shared issues and problems which emerged—similar to the struggles experienced by the schools participating in the AAI Project—were used to develop a protocol of probing questions. The questionnaire was distributed to those schools we spoke with and completed by a diversity of staff members. Issues included creating small learning communities, formulating common school goals, integrating curriculum, creating themes for schools or classrooms, defining real and relevant learning, creating field-based learning, and implementing school change.

With these questionnaires, we identified more common issues and held follow-up phone interviews with the respondents. We were not seeking answers to difficult questions of school change; rather, we were gathering advice and perspectives. What we learned from these teachers about creating small learning environments, integration, and field-based learning programs overlapped tremendously, both in content and process. While it is somewhat artificial to discuss pieces of the system as if unrelated to one another—that is, curriculum or schools-within-schools—we isolated them in order to capture in-depth and specific lessons. Thus, this chapter conveys advice from teachers of these complementary reforms about efforts and processes that are similar to the AAI teachers in the case studies. They do not provide single answers to obvious barriers; rather, they present dilemmas and pose a variety of ways to approach them. They then provide a host of questions to consider as schools begin to redesign. In the next three sections, teachers from complementary reforms discuss creating small learning environments, integration, and field-based learning programs.

Creating Smaller Learning Environments for Students

> By creating smaller schools-within-schools, teachers increase interdisciplinary interaction with other teachers, students see a unity and relevancy among their classes, and students will feel more involved in a school community. These outcomes will effect an improvement in student-student, student-teacher, and teacher-teacher relationships and, therefore, enhance student achievement. Our students and teachers in [schools-within-schools] receive more interdisciplinary input, feel more of a "small school" intimacy, and have a greater identity.
>
> —A Teacher

All of the complementary reform efforts, as with proponents of AAI, see great value in creating smaller learning environments for students. While smaller school structures often live under the guise of several names—academies, school-within-schools houses, or clusters—they have similar characteristics: a common cohort of students (usually 200 to 400), who are working together with a common cohort of teachers. Together, the teachers (and often the students) create the curriculum around an agreed-upon focus or area of inquiry.

As evidenced by the teachers involved in the AAI project, working together is both refreshing and difficult. A similar response was conveyed by the teachers that we interviewed from complementary reform efforts. They urged us to convey to readers the importance of "process" type issues, including creating a common vision, building a consensus, establishing group dynamics, and taking the time for reflecting about progress. As one teacher said in regards to the importance of vision,

> Even though the visions and the realities are not quite the same—you have to start from someplace; if you don't start with a vision, you might as well forget it. The vision has now come more in line with the reality, in that we cannot always get what we want, though we work very hard to do it.

While another captured the essence of working as a team:

> We still disagree all of the time, but then we come to true consensus. True consensus, the way I see it, is agreeing with your own little caveats—listen, I don't think this is going to work, but I am going to go along with it for now, and if it doesn't work, I am not going to say I told you so.

While it seems quite obvious, we learned once again that in the formation of a school-within-a-school, the establishment of professional and pedagogical viewpoints is but half the battle—the interpersonal relationships among the teachers cannot be overlooked.

Dilemmas

In addition to the advice about the change process, teachers shared with us their dilemmas about the structural and conceptual framework of building smaller schools and programs. They wrestled with how to select a theme for the program and then help students decide which theme is for them. They held many conversations about how to use themes without re-creating tracking between houses or academies within a school, and how to balance the focus of the theme within existing vocational and academic standards. These dilemmas pertain equally to programs when AAI is the theme. As teachers reflected on their experiences, here is what they told us about these dilemmas:

Making Schools-Within-Schools Distinct

Because teachers wanted to create schools-within-schools that students could identify with and feel a sense of belonging to, they needed to make these schools distinct from one another in some way. Teachers brainstormed about ways to make everything from curriculum to student groupings to particular skills developed foster this sense of belonging so that students would not get lost in the shuffle. Because they chose to emphasize "community," many schools-within-schools became isolated within the comprehensive high school. Each functioned as the one-room schoolhouse ideal and, therefore, was isolated from others. Because the priority was to create a community for students, students could not be in classes with other teachers, scattered throughout the building, as this would be disruptive to the close-knit and cohesive program.

However, they recognized that this type of isolation can both limit students' class selection, a benefit of large high schools, or lead to competition among different schools-within-schools. Some school-within-a-school teachers steered clear of isolation for these reasons among others. They rejected it because of the negative consequences which can result, namely, school-within-a-school competition, limited student choices, limited career exploration and skill development, and tracking of students.

Clearly, questions of isolation or program integrity create a tradeoff that teachers and students need to make. There are two issues teachers discussed in regards to this tradeoff—the effects a theme-driven, isolated school-within-a-school can have on a student's high school experience and the competition between schools-within-schools.

Creating and Using Themes in Schools-Within-Schools

Using themes to create distinct schools-within-schools was common with the teachers we interviewed. Some teachers saw themes as a means to appeal to student interests, to provide a real context in which to learn abstract concepts, or to connect frequently separated subject areas. Others noted that themes ease the process of integration and provide students with a definite identity. Teams spent a considerable amount of time defining their themes, each using different methods. Clearly, this is a path common to AAI teachers, where the theme is focused on a broadly defined industry.

Some of these schools did develop their themes based on broadly defined industries in order to prepare students to enter careers in the field upon graduation. Other schools explained that they developed their themes based on student interests, while others developed them based on teacher interest—or what they found exciting. If teacher interests are at the center, teachers will be more invested and excited about what they are doing and regard it as worth the difficulty of starting a new school. This excitement will, in turn, trickle down to the students. They learned that teacher buy-in can be as important as establishing student interest—it is difficult to foster student interest if teachers are bored themselves with the process and content.

Some teachers warned us about the tension between using these themes to drive a program and allowing these themes to become ends in themselves. Because developing a school around a theme is a complex process on many levels, a theme can end up being little more than a catchy add-on to a school and fail to accomplish any of the goals it has the power to accomplish. One teacher warned,

> I think having a theme is catchy right now—it is not that they are bad, but alone they are not enough. I am skeptical of programs designed around themes like "law," "arts," etc. The names become the means and ends and often the curriculum is the same old same old.

And another said,

> When [x] program got started, it was the same old same old, only they met together on occasion. They haven't really changed anything. It is the same old thing, just packaged differently. It is like buying a box of Frosted Flakes with the new packaging—they really haven't changed, and their philosophy isn't any different. They have restructured what they call it, but they haven't restructured their thinking or the delivery of instruction.

Thus, as the teachers involved in the AAI project learned, it takes many years to re-create a school or projects with strong themes; it is more than re-grouping students, but, instead, cuts to the root of each discipline. Teachers need to reconsider what and how students learn. However, when they are successful in making programs distinct from one another, another dilemma arises—student choice of which school-within-a-school they will attend.

Why Students Choose Themes: How do students chose which school-within-a-school they will attend? One teacher explained the formal process at her school:

> Students make their own choices as to whether or not they want to attend this school-within-a-school. We go around to incoming ninth graders and do a presentation—they see presentations from each of the schools-within-a-school in our school building and they make their choices. . . . At the end of each year, students once again choose; and those who are uncomfortable and want to get out may go to a counselor and make another choice.

We learned that recruitment to schools-within-schools was somewhat minimal, while young students, age 13, had several pressures weighting down their decisions—including family and friends. Teachers explained, for example, that they advertised their schools-within-schools on Whittle TV and through assemblies at middle schools. Because students received only a brief overview, their choices were probably not *that* well-informed. With school-with-a-school themes focused on career exploration/development and academic consistency, student decisionmaking is critical. Regardless of whether or not the staff of a school perceives a theme to be a means to prepare students for a specific career or a means to further ends, students often perceive the use of the theme in the same way.

We asked teachers how and why they believe students choose a particular theme or school-within-a-school. Most said that many students simply decide based on peer decisions or based on a limited amount of knowledge. One teacher provided the following opinion:

> Maybe one-third have somebody who is in that field in the family, or friends or relatives; another third may be sort of ambivalent—they don't know what they want to do, but this sounds interesting; and another third just happen to get into it because of a particular teacher or it has a good reputation or their friends are there.

Another teacher from a vocational school commented,

> Students make their choices for a variety of reasons, some more well-founded than others. More serious, mature students think of reasons such as security, opportunities, and a genuine satisfaction. Others have reasons such as that is where my friends are, it's fun, or it's where the money is. They can be influenced by a career area instructor, curriculum, opportunities, friends, family, and popular opinion.

How comfortable were these teachers with this process? Not many were—most expressed their reservations. Many indicated that, as they created components of the schools-within-schools, they focused the majority of their time on designing curriculum and building teams of faculty members. Consequently, they neglected, to some degree, to figure out better methods by which students can choose the program in which they will enroll. Given this, teachers felt they needed to think about building flexibility into programs and defining broad foci for themes. Both of these solutions are similar to the core goals of programs using the AAI theme.

Tracking: Related to the issue of program integrity and student decisionmaking is tracking. Teachers and administrators warned of the tendency of theme-focused schools-within-schools to unintentionally become tracking systems as, in an attempt to create program integrity, they became autonomous and isolated. The beauty of schools-within-schools are its focus, student identity, and community; however, the means used to achieve these goals often limit the content students are introduced to or the skills they develop. Furthermore, themes also limit students' opportunities to work with a diversity of other students. One principal from a vocational high school commented on this tendency. Because there is a movement at his school to create clusters of similar career areas and to schedule students within those clusters into the same classes, he worries deeply about the potential negative consequences of such a movement. While the benefits towards vocational and academic integration could be tremendous, he points out,

> If the academics are bound by a theme, if you are in auto body and auto mechanics then you are going to have the same English teacher for three years and the same group of students. You're limiting; you are tracking. Some career areas attract more males and others more females; it leads to homogeneous groupings.

Teachers affiliated with schools-within-schools continually questioned how autonomous their programs should be. They emphasized the need for very flexible structures—structures which allow students to move easily from one program to another and suffer no consequences, for example, allowing students to remain in high school longer to complete extra requirements. Although flexibility sacrifices program integrity and integration across subjects, teachers advised that schools-within-schools provide students with the option to participate in programs and classes in other schools-within-schools. The goal is to strike some sort of a balance. As one teacher suggested,

> What needs to be done is that [students] have to be allowed to go out of their small school to get extra, supplemental types of classes. We have to build that type of flexibility to ensure that students who want to take auto shop or a psychology class which may not be in their small school curriculum, have that opportunity. . . . Whatever works best for the particular student should be the focus—you have certain core classes [within the school-within-a-school] that every student is going to take—those are the meat and potatoes—but I don't think you can then hold students back from venturing out and having other experiences.

Another teacher explained that students within his school-within-a-school can move around if they find that a theme program they have chosen is not for them. Programs and classes which are established within particular theme-driven schools-within-schools are not exclusively for students from that school. If students are interested in health careers, but are not part of the health school-within-a-school, they have the option to participate in an internship program run through the school-within-a-school or take a science class designed for the school-within-a-school. He believes this will help students to explore different fields while developing their skills in a specific area. Themes should not limit options for students either within the program or outside of it; flexibility needs to be built in so that students do not feel trapped within one program or shut out of another.

Flexibility broadens the opportunity for career exploration. If one school-within-a-school is designed around the theme of business and another health, what opportunities exist for students to learn about the career area affiliated with a different program in the school? If students are enrolled in a business program, does that mean they will have deep exposure to the business world but little understanding of the opportunities that exist within the health industry? Without such opportunity, both skill development and the breadth of career exploration may be limited. As one teacher pointed out,

> A student in the health program will definitely learn about health careers, but because of the lack of teacher availability, will not be able to take a language or an advanced math or science course. Also, he will not be able to learn to type, nor learn what other occupational areas might suit him. It's fine if a student KNOWS what he wants to do at the end of eighth grade. [As a teacher in a business program], I have no idea what I would tell a student who might want to go into art. We have an art school-within-a-school, but [business students] cannot take their classes.

The same concern about students' experience in and exposure to a diversity of career areas also holds true for subject matter content. While isolated theme schools have the tendency to limit students' career exploration, they also affect students' overall academic education. For example, as some schools place a greater focus on the arts, students may lose out on math and science skills; as another focuses on science, a student might lose out on writing skills. Among the teachers we spoke with, a general concern surfaced about the creation of well-rounded programs for students. As many schools-within-schools create focused programs to appeal to student interests and facilitate the integration process, teachers highlighted the pitfalls about sacrificing academic standards in certain disciplines. As schools–within–schools become more focused, they can become isolated, lose their connections to the comprehensive school, and lose sight of connections to certain academic areas. Questions surface over how far, curricularly speaking, the theme should drive content. As one illustrated, "One school-within-a-school may have a strong humanities component but a weak math and science one, while another has computers as an integral part of [its] program." How can the experiences that students receive be equal in terms of standards across the board?

One teacher advised that the role of department heads should be reestablished to maintain standards for each discipline across the schools-within-schools. In many schools, they are currently little more than figure heads, and the school-within-a-school coordinators have taken the lead: "If there were meetings, not just in the schools-within-schools, which is what we are basically doing now, if we met by departments as well, there would be more cohesion. . . . At the moment, there is no definitive curriculum."

One school, which has made enormous strides in working through some of these tensions, affirmed this idea. This particular comprehensive school has maintained the role of departments while creating schools-within-schools, which has made a difference in both communication and academic standards. Another practitioner explained how, initially, the faculty created a schoolwide vision but it was too general and, therefore, did not, in her words, "translate into what went on in the classroom." Because the school was having a difficult time working through outcomes and standards, they broke into small teams. They attempted to focus conversations on issues of change in the teams, instead of having the frequently side-tracked conversations on student discipline, in hopes that they would establish components that would spread into a whole-school movement. The teams began to voice a desire for schoolwide standards and assessment because the teachers were worried about the lack of consistency in the academic content, skills, and rigor from one school-within-a-school to another. They decided to use the departments to establish schoolwide standards. One coordinator explained,

> That was something the teams had asked for because when they come to their team meeting, an English teacher on each one of those teams would bring only what they wanted. If we had schoolwide standards for what is expected in English, then they can come to their team table and say this is what my department feels is important for a ninth grader in English and that is being said at all four team tables, so there is much more continuity and it gets us a step closer to the school goals. We have begun that process by departments; the people will leave the departments and take the department information back to their teams. Then you have four subject areas (English, math, science, social studies) around a table, and each one brings to the table what their particular department or discipline says are essential skills. You lay them down on the table and say, "Okay, given that all of these departments would like to give for a ninth grader, what project would incorporate those?" It gives them a lot more of a solid foundation to start with. If each team is doing that, they are all starting with the same—

> this is what the department thinks is important—but then that will be tailored to who is on the team and to some extent the kids they are serving.

This process not only helped to provide students with well-rounded programs, it also made the process of integrating subject areas and establishing connections between classes easier than usual. However, clearly there is a tradeoff between allowing the whole school process to dominate versus school-within-a-school coherency, community, and integrity.

Competition Between School-Within-Schools

One key role teachers identified in creating schools-within-schools is that of coordinators. Coordinators are not only needed to oversee the development of their own school-within-a-school, but also for working with the other small schools within their building. They are needed to call meetings, facilitate planning, and oversee the development of relations with the other schools-within-schools. One pitfall to bear in mind is that, while all of the teachers we spoke with underscored the importance of this role, they also warned of problems that come with it: The coordinator is often a former teacher who has had no extra training for his or her new responsibilities. One teacher illustrated,

> The [school-within-a-school] coordinators need to receive more training. They need to be taught a little more about scheduling and the allocation of funds and group dynamics. Look at how much training a principal gets in all of the nitty gritty details to make a school run smoothly. These people are teachers—a lot of them just have bachelor's degrees. They have been in a classroom and don't know what form to use for what; they should be trained.

Another affirmed this comment with the suggestion that materials needed to be developed to train coordinators. She said it is too often assumed that if you have been running a classroom for fifteen years you are equipped to run a program. When coordinators are faced with the unpleasant task of facilitating a meeting, they have little experience to draw upon. She explained, "There is nothing in teachers' backgrounds that gives them that experience—you can't tell a team to open up its books and read when [the members] are getting out of control!"

We learned that a second problem of the schools with which we spoke, understandably, were the tensions which surfaced as groups of teachers began to establish their own school-within-a-school programs. School-within-a-school competition emerged throughout, leading to fragmentation of the comprehensive high school's student body and staff. Is there any way to attain peaceful coexistence if there is a need for such isolated structures?

Several teachers from one school spoke frequently about the "bad blood" that surfaced among faculty members throughout the comprehensive high school because the schools-within-schools were in competition about everything from resources, to students, to each one's successes and failures. Teachers from one school attributed this competition to the lack of clearly defined processes for allocating resources and the lack of a guiding mission for the school as a whole. As one teacher explained, these divisions can have a profound effect on students as well as staff. Schools-with-schools competition, animosity, and jealousy can spin out of control and result in stringent fragmentation and stratification throughout the comprehensive high school. She wrote,

> Students in one [school-within-a-school] do not get to know students in others. There is a feeling of alienation because the school is fragmented and, for the most part, does not work as a unit. Competition, jealousy, and back-biting are rampant among the [school-within-a-school] coordinators. They fight over funding, resources, room space, [and] supplies. At department and faculty meetings, they go from being mildly sarcastic to outright hostile. . . . The [schools-within-schools] have proved to be a double-edged sword. They are positive because they enhance students' self-esteem and provide opportunity for career development. They also offer teachers the opportunity to more fully interact with students and each other. They are negative because they often cause stratification, alienation, and dissatisfaction.

One teacher advises schools to bring in an outsider to help to work through the school-within-a-school relations. She believes this can help to alleviate some of the unhealthy competition that exists:

> Get some outside agency or somebody outside of the school to oversee it and intervene because if it is someone in the school, it is too personal—the principal could be accused of playing favorites when he or she really isn't. It creates a lot of animosity with people you have to live with.

Another school, which has established good relations between their schools-within-schools, affirms this advice. A teacher explained the interrelationship among the schools-within-schools as follows:

> The schools-within-schools have slightly different focuses, but ultimately, I think, they drive the focus of the school. It is like putting a mosaic together. A mosaic has some unity in order to be a product. There has to be some framework that the schools-within-schools fit into. You are going to be able to see the various parts of it differing, but in the end, there is going to be some amount of unity; there needs to be.

Another coordinator explained that good relations may have resulted because each school-within-a-school began with equal amounts of money and randomly grouped students so that there were no gifted or at-risk groupings. Thus, the allocation of new resources had been extremely fair. According to this teacher, the competition that exists between the schools-within-schools at her school is healthy—it actually motivates staff to do and learn more. She illustrated,

> In the spring, one [of the schools-within-schools] put up a showcase and they put student work in and suddenly there were all of these showcases of student work all over the school.

On the other hand, teachers from another school with a particularly unsatisfactory process for allocating resources pointed to money as the root of unhealthy competition within the comprehensive high school. One teacher recalled what happened when the comprehensive high school was given two language teachers without a formal process to determine how those teachers would be used by the six schools-within-schools:

> The Spanish teacher decided he liked one of the schools-within-schools and [that school-within-a-school] liked the Spanish teacher; they kidnapped him so he teaches all of his classes in that school-within-a-school. Students from outside of the school-within-a-school cannot taken classes within it. The students in my school-within-a-school cannot take Spanish. They do not have a language requirement.

What happens if students in her school-within-a-school have to take a language for college entrance? "Then they have to take it at a community college and pay for it—or otherwise they have the option of applying to the other school-within-a-school," she said.

One school also explained that the role of administrators was very helpful in maintaining a sense of equability. She explained that there were four assistant principals at the school, and each was assigned to a school-within-a-school. She illustrated what she viewed the positive effects of this to be:

> Three of the teams had really good, supportive assistant principals who rolled up their sleeves, took part in it, and had things to share. On one of

> the teams, the administrator chose not to go to meetings, or he would go once in a long while and then fall asleep when he was there. It may be a coincidence that was a dysfunctional team, but it got the least done because they didn't have the push. It wasn't all his fault, but certainly had he been there and helped to keep them on track, it would have helped.

Issues To Consider

According to the experiences of teachers, coordinators, and administrators who have begun the process of breaking their comprehensive high schools down into smaller units, in the end, the benefits are worth the energy required to create and sustain schools-within-schools. They did, however, advise considerable forethought before beginning the process.

As the previous section demonstrates, central to the development of schools-within-schools is the ability to problem solve and collaborate throughout the process. Creating schools-within-schools requires teachers to problem solve together to create a common vision, build consensus, reflect on decisions and practices, create themes, develop well-rounded programs, provide broad career exploration, and work through competitive schools-within-schools relations. As these teachers emphasized, it is necessary to figure out how to approach delicate tensions, tradeoffs, and dilemmas throughout the process.

The teachers we interviewed advise others to consider the following list of issues before and during the planning and implementation processes. These questions may help guide or frame conversations in your school:

- A continually evolving, common vision is critical to the success of a school-within-a-school. How will your staff develop this common vision? How will you ensure that it is continually evolving? How will all teachers, including new ones, take ownership of the common vision?
- What types of structures will your school establish for communication about key issues and the dissemination of information—for example, creating structured time for conversation, establishing common planning time, developing teams of teachers, and restructuring the physical layout of the school to allow for easier communication among different staff? How will your staff structure the meeting

and collaboration time you have? Will it be led by teachers? Administrators? Will your school-within-a-school meet with other schools in your building?

- As teachers have traditionally worked in isolation from one another, how will you establish the types of group dynamics required for collaboration and consensus building? Will you bring in outsiders to help with the process?
- When will you and your staff have time to reflect upon how the work is going?
- As many practitioners have noted, schools-within-schools need a certain amount of autonomy in order to be successful; are you willing to forgo a large range of classes for students to choose from for the benefits of an autonomous community?
- If you and your staff want to develop a school structured around a theme, how will this theme be *used* within the school as a whole? How will students choose your theme school? How will you ensure a flexible structure and intercareer exploration within the theme to ensure that students do not get "stuck"? How will you ensure that standards are not sacrificed in one academic area in order to improve another?
- How will you and your staff select a director or coordinator for the school, and what type of extra training does that person need to take on this new role?
- What will the role of your umbrella school be? How will you interrelate with the other schools within your larger school building? How will you network with these schools and set a tone of collegiality instead of competition? How will resources be allocated among these schools? How will you create close-knit communities for students without creating interschool rivalry?
- How will you create distinct and coherent programs within your school building that do not result in tracked programs?
- How will you assess your program and according to what criteria?
- How will you balance the demand of establishing your entire school-within-a-school while continuing to work through creating a personalized and active environment in your own classroom?

Integrated Curriculum

> [An alternative program] for some fifty high school students was begun as a noble attempt to address academic [and vocational] disciplines through a self-contained, integrated, crosscurricular, experiential approach to the curriculum. The students would learn math, in part, through building a post and beam barn on the school property, and then running a small construction business; they would learn history, in part, through participating in the archaeological dig, and researching courthouse records to uncover information about the families buried in a local graveyard. Though the program had an undeniably positive impact on the self-esteem of several of the students for whom little in the school to that point had been rewarding, academics, as so often happens in this kind of effort, got shortchanged. By the end of the first year, the conclusion of most involved was that the effort had fallen short of the expectations: "The planning had been inadequate, and the sought after integration of disciplines was uneven. . . . Students, unless highly motivated, fell into patterns of storm and rest. Many did more resting than storming."
>
> —Eliot Wigginton
> Founder of the Foxfire Approach

Different types of integration were frequently discussed by teachers we interviewed: within academic subjects (i.e., algebra, geometry, and logic); across academic disciplines (i.e., math and science); and between vocational and academic subjects. The integration process was often driven by projects, themes, or common skills. Integration provided a "real" context for students to learn abstract concepts while helping them to understand applications, as illustrated in the above quote. The purposes for integrating often varied: contextualizing learning, making connections between subject areas explicit, or enforcing certain skills across subject areas. As the statement above illustrates, integration is not without its own set of pitfalls; it requires careful planning. These pitfalls, or dilemmas, will be illustrated throughout this section.

Dilemmas

In talking with teachers from complementary reforms about integration, several questions or dilemmas cropped up: "What happens when the integration of various disciplines and certain subject areas does not fit?" "Is there a point at which integration can be taken too far?" and "How often should we integrate?" These issues are parallel to those experienced by teachers restructuring around AAI as they redesigned courses in a broader, more integrated fashion.

A related issue that practitioners mentioned was balancing the integration of instruction without letting integration be too limiting. Some teachers felt frustrated about using a theme for integration of subject areas. At times, they found themselves *forcing* things into a context to establish unnatural connections. For example, connecting history and math was not that easy—as making a lesson plan in geometry connect to one on World War II does not always come that naturally. Furthermore, contextualizing an academic area such as science into a business curriculum is not that simple either. As one business teacher joked,

> Some of the areas are really easy for me to integrate with, but we've had discussions with the science department—we can't see a connection. . . . There were jokes about teaching the chemical breakdown of White Out! There is some limitation in terms of theme integration. Does there have to be a connection between every academic area and every vocational area? Maybe we need to look at [theme] integration where it makes logical sense—I'm all for it, but I don't think we need to rack our brains to see how areas fit.

Another teacher highlighted this point by explaining that her school tries to choose general themes with which to integrate in an effort to avoid teachers the feeling that they are shoving things in unnaturally. She gave an example: debates were used as a theme to integrate history and English when students studied the legal system. After the students read *Of Mice and Men*, two teachers thought they should put the character George on trial. Two other teachers felt that was stretching things—they had done trials in civil and criminal issues and thought this was pushing the connection a bit too much. The resolution for these teachers was to teach debates through *Inherit the Wind*, and when they taught *Of Mice and Men*, they would focus on the Depression and relationships, as opposed to criminal issues. Thus, teachers have learned to lend a certain amount of flexibility with themes—they should be broad enough to incorporate several different areas and, at the same time, flexible enough to put aside, if necessary. According to this teacher, themes should never be limiting to the point that teachers must throw subject matter away because it does not fit the theme, or that they must force it in somehow.

Clearly, the larger and underpinning issue here is the question of how often curriculum should be integrated. This question has greater significance in the case of schools-within-schools. Integration, in this case, can help teachers move beyond thinking about how two, or even four, years of their particular discipline connect and create coherency for students. Teachers contemplate how four years of *all* of the disciplines connect and add up to provide coherency to the usual "shopping mall high school." Given this, the following is another set of dilemmas for teachers to consider:

- How coherent is a program to students?
- How do the various components of their schooling fit together?
- Is it enough to connect a few components of the school program and not all?
- How do a student's classes, projects, work-based learning experiences, community service experiences, and so on, all add up in the end of high school?
- Do students feel connected to a program and as though they receive a well-connected experience? How can this be assessed?

The teachers we interviewed said that the first step in being able to answer these questions was to get to know the school: By getting to know the school, the following types of comments were eliminated: "I don't really know what goes on in those internship experiences because I am not directly involved in them," or "I am not sure how the math department is dealing with the issue of integration because I am part of the science department." The small school structures can help with this disconnection and isolation, as the staff is smaller and, therefore, meetings are more intimate. One teacher, who was from a somewhat large school, said that she feels it is essential that teachers know what goes on throughout the school. She said that in her school, they share information and activities through inservice meetings as well as through student exhibitions.

One of the ways in which teachers get involved in their school and learn about what happens in other classrooms is through governance, committees, and site-based management teams. These structures help teachers to voice their input, as well as reflect on their own practices and the practices of the school. However, isolated committees are not always the solution to sharing information, according to one teacher whose school has used them. A multiple committee structure depends on coordination among the various committees in order to facilitate coherent and comprehensive change. One principal explained how the process at his school has addressed this issue:

> We have a steering committee and we have department chairs and vocational cluster coordinators. We raise an issue, and each member goes back to their departments or clusters and presents the issue and finds out what people think. The member then brings the information back to the steering committee and we get a sense of where everybody is at. Or we just have an open conversation and anybody with a concern can come.

Another principal explained that because they have a small staff at her school, they use weekly faculty meetings, as well as retreats, to reflect on issues going on in the school to determine if and how things need to be changed. Reflection, once again, is the key:

> We have weekly three-hour faculty meetings; I can't say that they are always reflections. We have a retreat—we spend about half a day reflecting just on our own practices. We go overnight and spend time on different issues. We spend time on a very personal level—what goals did we set for ourselves and what's our evidence that we've helped kids in learning and what goals have we met and where do we need to work through things. We have everybody spend time writing [to] themselves and then everybody shares. Curriculum teams meet once a week as well and then what happens is generally they'll say, "Wow, we've kind of gotten away from where we said we are going to go because the idea also is that we plan the curriculum." The broad strokes are established in July but then you get kids and of course it changes the ball game—"What do you mean you don't find this interesting? We thought it was fascinating!" And if it isn't working we have the flexibility to change things.

Some practitioners felt that as transformational plans were created, staff needed to come together in frequent meetings to discuss events and practices throughout the school, and to assess their progress. However, many practitioners said that, regardless of the frequency of meetings that take place during the week, it is difficult to work through critical issues because there are too many immediately pressing issues. Inservices, trainings, and workshops were recommended to help with this task as staff members need concentrated amounts of time to work through complicated issues. Some of the more effective trainings identified by practitioners have been those that use experiential learning methods themselves—ones that help practitioners to internalize the processes and principles. One teacher described a Foxfire workshop that she went through in which teachers themselves led the program. They went through community building exercises and, unlike most workshops, were not expected to sit and take notes, but, rather, designed the workshop themselves and searched for answers on their own. After sharing an experience like this, most of the teachers had a similar understanding of what a set of core principles really meant. Only after all of this were they then ready to think about the core questions of integration identified above.

Others approached the question, "How much sense do four years of high school make to our students?" through a focus on whole-school assessment—assessment that extends beyond the day-to-day functioning of the school to how students were doing in general. They cautioned us that assessment needs to extend to what happens to the students once they have graduated, if this question is to be answered. As one practitioner voiced,

> Part of the problem is we don't hear enough about how the kids are doing when they leave. There is very little follow-up. We have no way of judging ourselves as a school and our program if there is no feedback. The only thing I can do is check up on those students graduating from my advisory group and see how they are doing.

Issues To Consider

Regardless of the approach teachers take, as the previous section illustrates, integration demands new ways of working for teachers—for example, within and across subjects and within and across grade levels. With an integrated approach to schooling, teachers must engage continually in a problem-solving process in order to figure out how to redesign curriculum and course sequences. They begin to consider new balances of content and coverage as they consider thematic or project-driven curriculum crossing discipline boundaries. Here are a few questions to consider during the planning and implementation process:

- What changes need to be made in your schedule to enable an integrated approach? If your school is a vocational one, would you like students from the same career areas to travel together to enable better integration? If so, how will you deal with the homogeneous groupings that will develop?
- As you and your staff are required to work together more and more for such an approach, with what types of professional development trainings will you need to learn to work *together*?
- If teaming is not a reality for your school, how will you integrate? Will you use outsiders? If so, do you feel comfortable giving up your class to outsiders? Are

there manageable ways for you to develop skills and knowledge in different areas in order to act as more of a generalist on your own?

- How much do you want to be integrating? Is there a point at which integration can be taken too far? How broadly should your themes be defined? What if something doesn't "fit" into the theme comfortably—do you not teach it, force a connection, or teach it independently of the theme? Should all of the subjects be integrated or just ones which fit together more easily? Should distinctions remain between the disciplines or should they be fused into a coherent whole—what are the pros and cons of each?

- How much does each teacher need to know about what is going on in other classrooms and programs within the school in order to create a truly coherent program for students? How will your staff disseminate this kind of information or learn about one another's practice?

- How will you balance thinking about what should happen on a daily basis with considering how four years of integrated curriculum should add up?

- Would you and your staff like to take an approach where you begin with a project or theme and then see how the various subject areas fit into it, or would you like to begin with the subject areas and the skills and knowledge each would like to develop and then design a project or theme based on the overlap? What structures does your school have to support each of these approaches?

- How will you ensure that students are developing a variety of skills within an integrating approach, not only sticking to what they are comfortable with?

- How will you retain an effective level of authenticity in a subject area when sacrificing content and skills for the sake of a more comprehensive, integrated project?

- How comfortable are you as a teacher, and as a staff, with implementing a less-is-more philosophy in order to focus on integration? How comfortable are you letting go of some of your subject matter in order to incorporate, or teach to, other subject areas? How will you balance student-driven instruction with demands for coverage?

Experiential Learning: Field-Based Learning

> What is called for is a more thoughtful style of instruction that grows naturally and positively out of our continuing experiences with students and our reflection upon those experiences—a style that is more attentive to the way learning actually occurs in the real world away from the contrived environments of our schools.
>
> . . . But there are many pitfalls with this—for example, a student-produced magazine where the intended purpose is to improve students' writing skills through motivating them to polish their work because it will have an audience. And that makes sense. In reality, however—and this is the voice of experience—the pressure of producing the final product becomes so intense that the potential of the idea is undermined. Students who write poetry will turn out several poems. Those who are facile with cameras take photographs. Inferior work is simply rejected. The magazine then goes to the press. And in honest hindsight, one finds that not a single student is actually writing better as a result of the project. Those whose writing is poor have been rejected again instead of being worked with to make the piece publishable. Those who write reasonably well have not been stretched at all. . . . Those who do not write at all have evaded the task again by taking pictures or selling ads.
>
> —Elliot Wigginton, The Foxfire Approach

"Learning by doing"—it is not a new idea; it was espoused by Dewey at the turn of the century and has reappeared in a variety of reform movements since, as an effective means of engaging students' interests. According to these teachers, students often pointed to their field-based learning experiences as their favorite part of school. Even among students who tend to have the greatest discipline problems in the classroom, experiential learning activities were enjoyed and valued. Teachers explained that experiential learning programs can be a motivating factor for *all* students, including those who are often hard to reach because of the sense of responsibility the programs instill.

Experiential learning is a significant part of each reform program discussed within this chapter. A glance at the guiding principles and philosophies of the programs illustrates its importance:

- *The Coalition of Essential Schools*
  The governing practical metaphor of the school should be student-as-worker rather than the more familiar metaphor of teacher-as-deliverer-of-instructional-services.

- *Foxfire*
  Work is characterized by student action, rather than receipt of processed information. Connections among the classroom work, surrounding communities, and the real world outside the classroom are clear. The content of all courses is connected to the world in which the students live.

- *REAL*
  Work in the REAL program is characterized by student action rather than by the student being the passive recipient of processed information. Connections between classrooms and the communities beyond the classrooms are clear. The class goes to the community and vice versa.

- *City/Community-as-School*
  The primary element of school programs should consist of placing students in the real world as interns.

- *Service Learning*
  Regardless of whether students serve at the school or in the community, students should be engaged in real and meaningful situations. They should be given supervised opportunities to test out theories by carrying into action their ideas in the community.

- *The Center for Collaborative Education*
  Schooling should consist of active learning situations with student-as-citizen and teacher-as-coach together engaging in external learning experiences.

Note that most of these program principles or elements, as with AAI, advocate connections to the community as well as to experiential learning. The combination of these two factors has led many schools of these reform programs or networks to develop experiential or field-based learning programs for a variety of purposes:

- developing skills
- exploring a career
- establishing connections with the community
- having a place in which to contextualize and apply academic skills

However, as indicated in the opening quote of this section, field-based learning comes with its own set of pitfalls. These pitfalls necessitate that coordinators and teachers of these programs consider the following issues and questions in implementing or centering their work around "active learning":

- What are the new responsibilities for both teachers and students working with field-based learning programs?
- How can the career and academic skills that students learn during experiential learning programs be made explicit to them?
- How can connections be made between field-based learning experiences and academic classes?
- How can the quality of external learning experiences be monitored?
- What types of prerequisites are necessary for field-based experiences?
- What types of reflection do students need to undergo in order to gain the most from their experiential learning?

The teachers involved in the AAI project have emphasized the need to structure field-based learning programs with these questions in mind. They believe, in general, that schools need to tap into the potential that field-based learning experiences have to enhance both career and academic development more than they currently do. The aim is to both engage students in their present learning and incite them to think about their futures. Teachers grappled with how to make field-based learning experiences more than just a "good experience." They continually ask themselves, "How can we make these experiences mean more to students than just a taste of the real world?"

Those schools that have developed structures to highlight the career and academic skills learned in the field are not only keeping students interested in school but also enriching learning. Field-based learning, when coupled with things such as reflective writing, a structured seminar, or an academic assignment, has enormous learning potential. Furthermore, the types of field-based activities that these teachers identified as academically enriching and rigorous are compatible with, and most likely already are a part of, academic programs. However, the teachers and administrators with whom we spoke during post-questionnaire interviews pointed out that it is easy for a school to say that it does, in fact, use experiential learning ideas, but this simple response needs to be pushed. It is important to question *how* and *why* experiential learning is used as their reasoning affects the design of the program. Who participates in the program? How do you ensure that students are achieving the program goals through these experiences? What is its purpose? As one teacher summed up,

> If the school-to-work transition program provides a direct link between academic and work-based learning, then I think the program has the potential to facilitate academic learning. Without some form of overt connection between the two, it is not clear to me if these types of programs would enhance academics at all.

Given this, teachers suggest considering the following issues.

Issues To Consider

In identifying the pitfalls to field-based learning, practitioners were advised to plan programs with an eye on maximizing students' learning experiences. In general, field-based learning experiences can reap great results—as has been shown decade after decade. However, they can also be a waste of time. Structure is the key. School-to-work transition does not mean simply placing students at a worksite to give them exposure and hoping that they walk away better prepared. It requires making explicit the skills learned, highlighting clear connections between what is learned in school and how it is used at the worksite, and illustrating how skills are transferable to a variety of areas. Once again, as so many schools have begun to include some sort of field-based learning program, the task now is to tap into those experiences more and more as a means of making them more academically rigorous and vocationally productive.

Some questions to consider in developing field-based learning programs, or assessing existing ones, are listed below as a beginning for conversation at your school:

- How can field-based learning programs be used as a holistic approach to reform as opposed to an adjunct program? How can the different field-based learning programs being used throughout your school be brought together to act as a leverage or catalyst for whole-school change?

- How are academic rigor and standards upheld in field-based learning while providing students with appealing experiences?
- How do academic teachers incorporate career development into their classrooms? Who at your school views career development as his or her responsibility? Should this change? If so, how will you make those changes? How will academic teachers develop the knowledge base to address career development? Do students need to learn a whole new set of skills and knowledge or are there other possibilities? How can teachers be better prepared to use field-based learning programs as integral parts of their curriculum while only having limited time to fulfill their existing responsibilities?
- How do you and your staff ensure quality field-based learning experiences? How do you ensure that when students are at a worksite, they are actually learning, and that they are connecting that learning to the learning they do in school and the types of things they will do in the future?
- What new roles do staff at your school have to take on to make a field-based learning program work?
- What types of components will you develop to ensure that students are reflecting on their experiences?
- Will you provide preparation for students before they begin a field-based learning experience? If so, what will this preparation look like and entail for teachers and students? Who will provide this preparation and when?
- How will you structure your schedule so that students do not miss too much of certain classes in order to attend their field-based learning experience?
- How will field-based learning experiences be tied, explicitly, to students' futures? Will field-based learning experiences serve as opportunities for career exploration? If so, how will you ensure that students are exposed to a variety of careers?
- Should specific and general skills be emphasized equally in field-based learning and career classes? What is the appropriate balance?

- If students participate in field-based learning experiences only within the school setting, how will you incorporate an element of reality—outside standards? Will you have audiences? If so, who will make up these audiences?

Conclusion

This chapter has presented a variety of approaches to school reform, all of which share the same aim of better engaging students in school. The approaches—creating small learning environments, integration, and field-based learning programs—overlap tremendously, both in content and process. Many of the goals of these approaches are similar, and those that are different from the others fit comfortably with them. This chapter has presented noteworthy reflections of teachers who are experiencing the good and the difficult of school redesign around the three themes. These teachers have raised many thought-provoking questions to which there are no clear solutions or simple answers; if we have achieved our aim, these questions and ideas can guide your own planning processes. The chapter does not include *every* issue integral to the restructuring processes, of course, though it does touch upon several that teachers found to be significant. Perhaps their ideas can serve as a catalyst to work through other issues and obstacles you have come across not contained in this chapter. The suggestion to explore these problems with other teachers and schools will prove to be fruitful. There are seemingly few problems that are unique to any one school; rather, there are shared problems that play themselves out a bit differently in unique contexts. While each school is, in fact, unique, we can still learn from one another and explore possible approaches to similar problems. We have seen that each school that is engaged in a process of change has something to share with others, as well as something to learn. A school that is beginning or continuing a process of school restructuring, or developing a single program for their school, might consider the following:

- *Learn from Others*
  Talk to other schools in your district, or district offices, to learn about the different constraints you are up against and what types of waivers are available. Talk to schools inside and outside of your district. Begin with the ones presented in this chapter; learn the specifics of how they began to tackle certain reform measures they were implementing.

- *Find Time*
  As a staff, block out times of the day (after school or lunch, unless common free periods are available) to begin to work together. Plan backwards from key goals, begin to lay the groundwork for what will be an evolving, common vision.

- *Count on the Importance of Process*
  Consider how to approach group dynamics and consensus building. Think about bringing in an outsider to help with this process.

- *Reflect*
  Think through the kind of school and school structures you have, and explore how flexible such structures are. Determine if and how you would like to change these, given your common vision and the approaches to reform you would like to implement.

Whether a school is developing an AAI program or working through the principles of the Coalition of Essential Schools, there are clearly a set of common issues which emerge during the planning and implementation processes. Whichever reform program and specific approach to change a school you choose to focus upon, it is clear that faculty will have to begin a rigorous journey characterized primarily by the process of problem solving. Each teacher who participated in this project highlighted increased demands on working with other teachers on everything from curricular planning to school governance. This collaboration was tremendously empowering, and at the same time terribly frustrating—it runs against the grain of what many long-time teachers are used to.

We have seen the demand for collaborative problem-solving reflected in the words of these teachers—through their ideas about, advice on, and experiences with creating schools-within-schools, integrating subject areas, and developing effective field-based learning programs. Our hope is that their tales will inform your own restructuring processes—helping you to anticipate tradeoffs and tensions that may surface before you make any firm decisions. As you engage in conversations with other members of your faculty, we hope that you will reflect on some of the questions and issues raised by the teachers' voices contained in this book. They may give you some ideas, they may warn you about roadblocks along the way, or they may just ease the pains of the change process.